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JOURNAL OF THE AMERICAN PHARMACEUTICAL ASSOCIATION

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THE SIXTY-EIGHTH ANNUAL CONVENTION OF THE AMERICAN PHARMACEUTICAL ASSOCIATION WILL BE HELD IN WASHINGTON, D. C. DURING THE WEEK BEGINNING MAY 3, 1920.

The American Conference of Pharmaceutical Faculties and the National Association of Boards of Pharmacy will also meet in Washington during week of May 3, 1920.

The U. S. Pharmacopoeial Convention will meet in Washington during the week of May 10, 1920. (Centennial Year of U. S. Pharmacopoeia.)

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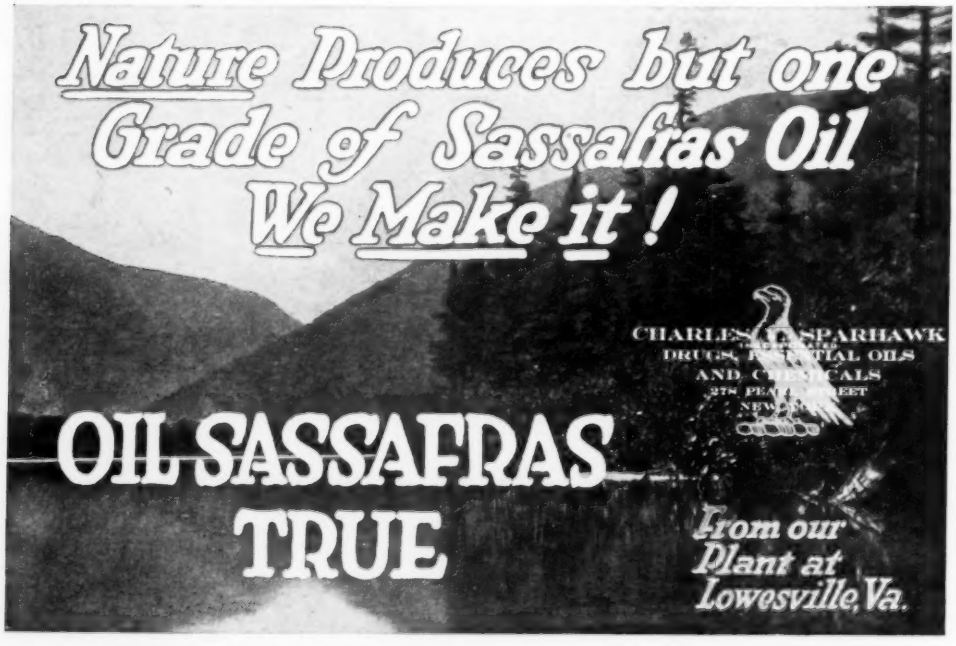
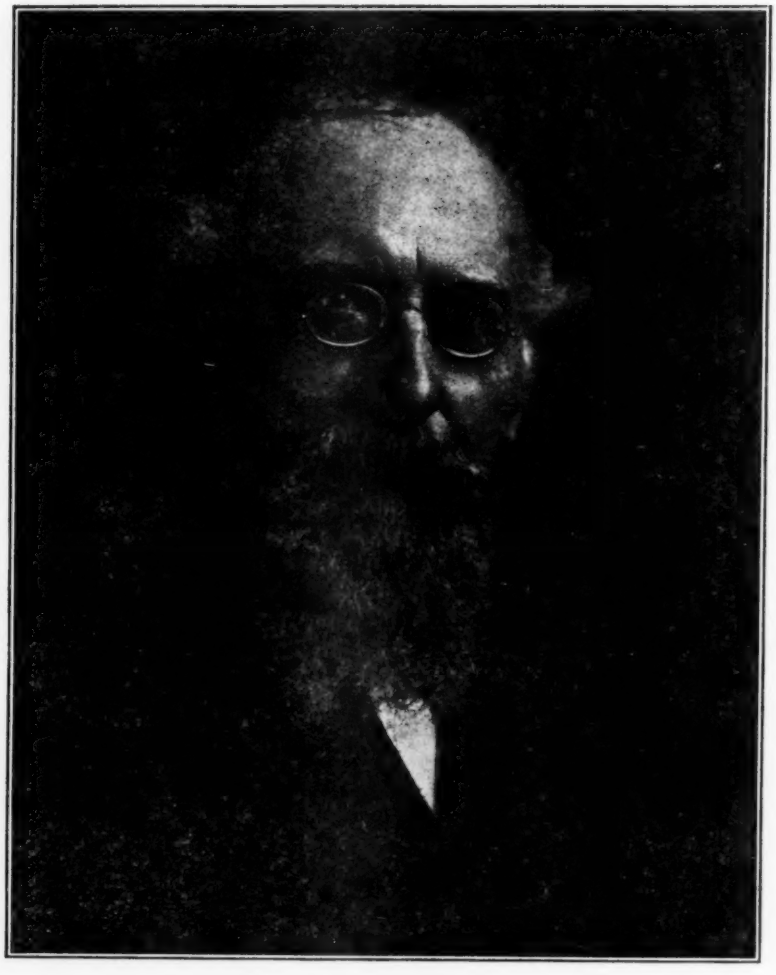


OTTMAR EBERBACH

ANN ARBOR, MICH.

For more than fifty years a member of the American Pharmaceutical Association.



OTTMAR EBERBACH

JOURNAL OF THE AMERICAN PHARMACEUTICAL ASSOCIATION

VOL. VIII NOVEMBER, 1919 NO. 11

OTTMAR EBERBACH.

Ottmar Eberbach was born in Ann Arbor, Michigan, November 23, 1845, and this university town, with the exception of the years spent as a student in German universities, has always been his home. His earlier education was received in the public schools of Ann Arbor, and much of the spare time during these school years was given to work in his father's retail pharmacy.

In 1862 he went to Stuttgart, Germany, where he studied chemistry under Fehling, and later he attended the university at Tuebingen. Three years later he returned to his native city, where he engaged in his father's store, and in 1876 became associated in the business, under the firm name of Eberbach & Son. The business is now largely devoted to the sale of physical and chemical apparatus and supplies.

Mr. Eberbach was one of the charter members of the Michigan State Pharmaceutical Association, and was its president in 1900. He was appointed on the first Michigan Board of Pharmacy, serving for nine years, part of the time as president.

He joined the American Pharmaceutical Association fifty years ago, in 1869. His contributions to the Proceedings are printed in Volumes 22, 23 and 24, and deal with alkaloidal content in commercial elixirs, crystallization of santonine, standards for preparations containing colchicine and exposure of the composition of "Vinegar Bitters."

Prof. A. B. Stevens, to whom we are indebted for these data, states that Mr. Eberbach is enjoying good health and takes an active part in the business of which he is the senior member. E. G. E.

EDITORIAL

E. G. EBERLE, Editor 253 Bourse Bldg., PHILADELPHIA

IF NOT FEDERATION, WHY NOT CLOSER COÖPERATION?

AT the recent Rochester meeting of the National Association of Retail Druggists, the Executive Committee reported on the subject of "Federated Pharmacy," as follows:

"At the convention last year we went into the question of Federated Pharmacy at considerable length and told you something about the proposition. It is too large a subject to take up and discuss in an executive committee report for the reason that it has a bearing upon every phase of work now carried on by the various drug trade organizations. Your Executive Committee has given a lot of thought to the proposition as presented by the American Pharmaceutical Association, for whom we have the highest respect, but we could not see our way clear to approve of their proposition. The more we studied it, the more it seemed to us that we would be working at a decided disadvantage if we accepted the proposition as laid down by their committee. Their idea is a splendid one but we fail to see how it can ever work out to advantage, particularly along the lines as suggested.

We believe that in the National Drug Trade Conference we now have the nucleus of an organization *which can do everything that the proposed Federation of Pharmacy had in mind to do* (italics mine, J. W. E.), but perhaps in a little different way. For the reasons above given, your committee decided to disapprove of the American Pharmaceutical Association's plan of federation."

The Executive Committee states in its report, also, that:

"It might appear from a careful reading of this and some other reports which will be presented to you that we are not particularly interested in the professional side of our business. That is a very mistaken idea. We are to-day, and always have been, intensely interested in the professional as well as the commercial side of our business. There are other pharmaceutical associations, however, that give a great deal of time and thought to the discussion of the purely professional and scientific side of pharmacy, and we think you all agree that they are doing a splendid work in that direction. As we have many matters of importance to consider, we have left that sort of discussion to them."

The report was referred to the Committee on Resolutions of the N. A. R. D. and later the following resolution was adopted by the Convention:

"*Resolved*, That it is the sentiment of this convention that methods should be adopted to insure the closer coöperation of the two parent national organizations of retail pharmacists and that a committee be appointed by the N. A. R. D. with instructions to coöperate with a similar committee of the A. Ph. A. in order to devise the best ways and means toward the accomplishment of this end."

In other words, the N. A. R. D. recognizes that there are two divisions of pharmaceutical practice, each with special interests—professional or scientific pharmacy, and commercial pharmacy; and while it is interested in both, it specializes in commercial pharmacy. On the other hand, the American Pharmaceutical Association, while interested in both divisions, specializes in professional or scientific pharmacy. What, then, could be more natural than that the two national organizations should join hands, as proposed by the N. A. R. D., in an endeavor to secure closer coöperation in both divisions, to the end that American Pharmacy may be bettered both scientifically and commercially?

If the American Pharmaceutical Association cannot realize its vision of a federated pharmacy, let us have, by all means, the closest possible coöperation, and not only between the A. Ph. A. and the N. A. R. D., but also, with the State Associations and with the national wholesale and manufacturing organizations, each caring for its own particular interests, in its own way, but each acting in harmony with the other bodies by means of conference committees; and who can tell but that such an arrangement may result in as great, if not greater, benefit to American Pharmacy, as a whole, as would result from one federated body?

The National Drug Trade Conference is a conference of coöperative committees of national pharmaceutical organizations to consider "drug trade" interests of national and general importance, including legislation. Its objects are expressed in its Code of Rules and Regulations adopted January 15, 1913 (J. A. Ph. A., 1913, 238), as follows:

"The objects of the Conference shall be to consider and report to the respective organizations represented therein upon matters of legislation, or upon any other matters of national and general importance to the drug trade."

It will be noted that the Conference exists to consider "drug trade" interests. It does not exist apparently for any other purpose. Its title, the National Drug Trade Conference, signifies this, also. *And being a trade body, it cannot represent professional or scientific interests, which are represented by other organizations.*

But why not apply the principle of national coöperation, not only along trade and legislative lines, as represented by the National Drug Trade Conference, but also, between the national pharmaceutical organizations along professional and scientific lines, by having coöperative committees from each organization, *and by making the American Pharmaceutical Association the clearing house for action on professional and scientific pharmaceutical questions?* The chief function of all the national pharmaceutical bodies, except the American Pharmaceutical Association, the American Conference of Pharmaceutical Faculties and the National Association of Boards of Pharmacy, is along trade lines; and these trade bodies are very deeply concerned in the growth and development of the sciences and art of pharmacy, in fact, the trade-success of their members depends upon it.

The N. A. R. D. points the way. But, let us have coöperative committees of *all* the national pharmaceutical bodies to confer on professional and scientific questions and use the parent body of all the national bodies—the American Pharmaceutical Association, which preëminently represents the professional and scientific interests of American Pharmacy—to put into effect the results of such coöperation.

If this be done, the benefits that will accrue to American Pharmacy, as a whole, will be simply incalculable.

On the one hand, we would have the trade interests of American Pharmacy promoted by the National Drug Trade Conference, as now, and on the other hand, we would have the professional and scientific interests of American Pharmacy promoted by conference committees of all the national pharmaceutical bodies working through the American Pharmaceutical Association as a clearing house.

If the plan of a federated pharmacy, as originally proposed, is inherently better than the plan of closer coöperation between individual organizations acting through the National Drug Trade Conference and the American Pharmaceutical Association, nothing will disclose this fact more quickly than coöperation along the lines suggested, and if this is not the case, then there is no necessity for a federated pharmacy as such.

J. W. ENGLAND.

AMERICAN PHARMACEUTICAL AND MEDICAL RESEARCH.

OUR attention has been called to a statement in one of our pharmaceutical journals, as follows:

"Where are the leaders who are doing research work in the pharmaceutical field? Good papers dealing with the scientific side of pharmacy are becoming rare. That there are a vast number of problems of importance and value on the pharmaceutical field goes without saying. Where are the students and the facilities?"

In answer Dr. Edward Kremers sent two monographs:

A CENTURY OF THE UNITED STATES PHARMACOPOEIA, 1820–1920. L. The Galenical Oleoresins. By ANDREW G. DU MEZ. Thesis submitted for the degree of Doctor of Philosophy, University of Wisconsin. 8 vo., 288 pages. University of Wisconsin.

PIGMENTS OF FLOWERING PLANTS. By NELLIE A. WAKEMAN. Thesis submitted for the degree of Doctor of Philosophy, University of Wisconsin. 8 vo., 146 pages. Published by the University.

The number of pages in the monographs accounts for their not being published in full in the pharmaceutical journals. Much research work is done in the laboratories of pharmaceutical and chemical manufacturers; in part, reports are made in publications devoted to pharmacy, chemistry, medicine, botany, etc. A reference to a few of the previous issues of the Journal A. Ph. A. also will speak for research work in pharmacy and this number of the Journal has a series of reports on Digitalis. In our opinion research work in pharmacy by American pharmacists has not been neglected and there is a widening field of medical science before us.

By the recent gift of $10,000,000 from John D. Rockefeller, to be added to his endowment of the Rockefeller Institute, additional research in biology, chemistry, physics and medicine will be carried forward. It is significant that Dr. Alexis Carrell has decided to stay in this country and will not return to France permanently. The funds for endowment made by Carnegie, Rockefeller and others will make the United States a mecca for foreigners who desire to continue their studies under proper laboratory conditions. Europe will not attract the numbers of American students as in the past.

When the special research provided for is correlated with medical education in general it can be discerned that the future for American medicine is roseate; higher technical education and scientific research in America are coming to their own and give the United States a supreme position. Pharmaceutical research has not been neglected but it needs financial encouragement. E. G. E.

THESE ARE PARLOUS TIMES.

SINCE the signing of the armistice a year ago uncalled-for strikes, rioting, mob violence, and every kind and manner of radical upheavals have occurred. There has been evident a spirit of unrest, a mad scramble for shorter hours and more pay. Never have operatives produced so little and asked so much. Such turmoil and confusion may be necessary to bring about a better understanding; our duty as citizens is clearly set forth by the Golden Rule.

Every right carries obligations, and no one can sidestep these who avails himself of his right; rights are limited by obligations, the rights of one class are qualified by the rights of another. There are groups who think they have the power to get what they want regardless of the rights of anyone else; they plot to use the power ruthlessly and with no regard for the rights of others. Extension of this power destroys government and leaves citizens at the mercy of those who wield it. It is developed because the majority of citizens are unmindful of their duties.

One of the results is that foodstuffs and manufactured goods are under the control of a few whose power is constantly increasing and operates to wrong innocent parties and bring loss and hurt to them. If there is one thing that should be seared upon the minds of people it is that we are our brother's keeper; if there is an obligation or duty greater than another, it is recognition of the rights of others.

More attention must be given to our duties. Our neglectfulness is shown in many ways; suffice it to point out two very familiar delinquencies—seeking to avoid jury service and indifference relative to suffrage. Last month, responsive to a summons from a Court of Common Pleas, only twelve out of sixty were willing to serve; the average election returns speak for the other defect. The administration of justice will lose that democratic character which has rescued it from abuses that were provoking revolution if the state of affairs relative to jury service

grows much worse. And if our disregard of the privileges of citizenship grows we can only hope to be controlled by those who are unmindful of the rights of others.

Much was expected from the International Industrial Conference; there is disappointment instead. The whole business would be a harmless farce if it were not for the bad temper and antagonism created, which will not be confined to those who were assembled. The ridiculous rules of the conference and the impractical method of going about its work were sufficient to thwart the energies and break down the patience of the serious-minded delegates. The segregation of the delegates into "employer," "labor" and "public" groups, and the prevention of any action except by group tended to promote class feeling, prejudice and stubbornness and to prevent the formation of any common feeling for the common good of those represented.

Coördination and coöperation, so essential in a reconstruction period, are not being effectively and efficiently made use of in industries, government or associations. The application of right principles is essential to effect right relations.

Attempts are being made to mold men and women by legislation, and frame laws in accordance with the viewpoints of the designers, ignoring those whose business is to be regulated. Personal or party advertisement is sometimes the motive for legislation, and the applaud of the galleries is an influential factor. Pharmacists, more than others, have been afflicted with legislation, because of the variety of stock carried by them and the restrictive legislation affecting medicines. And now the strike-mania has developed among the employees in drug stores; the control of drug stores and pharmacies will be lost to the owners if they yield to organizations that can direct their employees. Let us reason with one another and develop a morale which signifies belief in one another. E. G. E.

PRELIMINARY NOTE ON A NEW PHARMACODYNAMIC ASSAY METHOD.*

CARASSIUS AURATUS (GOLD FISH) AS TEST ANIMALS FOR THE DIGITALIS SERIES.

(Continuation of a Previously Reported Paper.)[1]

BY PAUL S. PITTENGER.

In a previous publication the author states that

"Although the methods employed at the present time for biologically standardizing digitalis and its allies have enabled the manufacturer to supply the physician with preparations of known and definite activity, there are still some things to be desired:

First: A reduction in the cost of the assay;

Second: A more sensitive method, and

Third: A method simple enough that any competent pharmacist or physician can carry it out equally as well as the expert."

"In experiments on frogs and guinea pigs we have always been of the opinion that after taking care of the weight and temperature factors, the most important cause of animals' dying or recovering "out of order" is the marked variation in rate of absorption. The great absorptive power of the gills of a fish, together with the fact that they contain a large number of blood vessels through which the blood circulates direct from the heart, made this animal present itself as a possible means of eliminating these variations due to absorption."

The result of several weeks' experimental work is then given as a basis for the following conclusions:

1. Gold fish are sensitive to variations of $2^1/_2$ percent in the strength of the dilutions of digitalis in which they are placed.

2. Variations due to differences in the rate of absorption appear to be practically eliminated by the use of these animals.

3. Decreasing the strength of the dilution increases the sensitiveness of the test.

4. The weight of the fish may be disregarded when making tests by this method.

5. Variations in the temperature markedly influence the resistance of gold fish to digitalis poisoning.

6. The individual variation in the susceptibility of gold fish is much less than that found in guinea pigs and frogs.

7. The gold fish method is unquestionably the simplest so far proposed and can easily be carried out by those not especially skilled in the pharmacodynamic art.

8. The inexpensiveness of the assay is decidedly in its favor. Gold fish of the proper size can be purchased wholesale for from 45 to 60 cents per dozen.

9. A sufficient number of animals can be procured at all seasons of the year.

---

*Read before Scientific Section, A. Ph. A., New York meeting, 1919.

[1] J. A. PH. A., April 1915.

The experiments which led to the above conclusions were preliminary in the extreme, as they covered a period of only three weeks before the annual meeting of the A. Ph. A. at which time the paper was read. It was apparent, therefore, that in order to prove the value of the above conclusions, more extensive and detailed experiments would be necessary.

The time being limited, it was impossible to carry out all the experiments which suggested themselves, and the author stated that the investigations would be continued in an endeavor to determine the following:

1. The best time limit and
2. The most suitable dilution leading to
3. Tentative standards.
4. Action of other members of the digitalis group.
5. Extent of seasonal variations.
6. Best temperature to employ.
7. More extensive experiments on the effect of alcohol.

Owing to the exigencies of abnormal conditions existing during the past three years the enormous increase in regular routine work made it impossible to attempt any research which was not absolutely essential.

During the last 8 months, however, detailed experiments involving the use of several thousand fish have been carried out in order to devise and perfect a satisfactory gold fish method and to arrive at definite conclusions as to its value for standardization purposes.

As the previous experiments indicated that temperature was an important factor, the first series of experiments was carried out in order to determine the influence of variations in temperature upon the resistance of gold fish to digitalis poisoning.

TEMPERATURE.

The results of these experiments verified our former conclusions that "*variations in the temperature markedly influence the resistance of gold fish to digitalis poisoning.*"

We found that the greater the temperature the lower the resistance of the fish and *vice versa*.

Of the many experiments conducted the following two tables are typical examples of the results obtained:

TABLE I.

Temperature.	Amount of tincture in 500 mils.	Time required to kill.
22° C.	2.1	4 hrs. 20 min.
22° C.	2.2	3 hrs. 44 min.
22° C.	2.3	2 hrs. 30 min.
22° C.	2.4	3 hrs. 41 min
22° C.	2.5	3 hrs. 35 min.
22° C.	2.6	3 hrs. 26 min.
22° C.	2.7	4 hrs. 20 min.
22° C.	2.8	2 hrs. 57 min.
22° C.	2.9	2 hrs. 21 min.

TABLE II.

Temperature.	Amount of tincture in 500 mils.	Time required to kill.
29° C.	2.1	2 hrs. 15 min.
29° C.	2.2	2 hrs. 41 min.
29° C.	2.3	3 hrs. 5 min.
29° C.	2.4	2 hrs. 50 min.
29° C.	2.5	1 hr. 57 min.
29° C.	2.6	2 hrs. 6 min.
29° C.	2.7	2 hrs. 30 min.
29° C.	2.8	1 hr. 35 min.
29° C.	2.9	1 hr. 47 min.

It will be noted from the above tables that at a temperature of 29° C. the fish all die in from 1 hour and 47 minutes to 3 hours and 5 minutes, whereas at a temperature of 22° C. the same amounts of tincture of digitalis required from 2 hours and 21 minutes to 4 hours and 20 minutes to produce death, thus proving the fact that the lower the temperature the greater the resistance.

After proving that temperature exerts a marked influence upon the resistance of the fish, our next problem was to determine the most satisfactory temperature at which to carry out our tests, or in other words, at what temperature we would obtain the most concordant results. The results of our experiments along this line showed that equally satisfactory results could be obtained by any temperature from 18° C. to 25° C., so long as the same temperature was maintained throughout the test.

However, we arbitrarily chose 22° C. as standard temperature at which to carry out the test for the following reasons:

1. Approximately ordinary room temperature.
2. Approximate temperature at which fish are usually kept.
3. Easily maintained.
4. Approximate temperature of running "tap-water" in summer (Phila.).
5. Satisfactory results obtained and ease in maintaining this temperature for frog work.

All of the earlier experiments were conducted by placing the fish directly into beakers containing the solution of the drug made from tap water, regardless of the temperature of the tap water. The beakers were then immediately placed in the constant temperature bath.

Our experience with frogs suggested that we determine whether our results would be effected by bringing the temperature of both the drug solution and the water in which the fish were stored to the standard temperature of 22° C. for at least one hour before placing the fish in the solution.

Accordingly, several experiments were made and the following tables are typical examples of the results obtained.

Table III shows that three out of six fish died out of order, whereas in Table IV only one fish died out of order, showing that more concordant results can be obtained by keeping the fish at a constant temperature of 22° C. for at least one hour before placing them in the drugged solution. Again, it will be observed that on an average it required less time to kill in Table IV than in Table III.

TABLE III.

Fish taken from aquarium, temperature 12° C. and placed in drug solution temperature 12° C. and immediately placed in constant temperature bath at 22° C.

Amount of tincture in 500 mils.	Time required to kill.	Remarks.
2.0	4 hrs. 42 min.	Died out of order
2.1	4 hrs. 53 min.	
2.2	4 hrs. 20 min.	Died out of order
2.3	3 hrs. 45 min.	
2.4	2 hrs. 56 min.	Died out of order
2.5	3 hrs. 41 min.	

TABLE IV.

Fish kept at 22° C. for one hour before being placed in drug solution which has also been kept in constant temperature bath at 22° C.

Amount of tincture in 500 mils.	Time required to kill.	Remarks.
2.0	4 hrs. 55 min.	
2.1	4 hrs. 40 min.	
2.2	4 hrs. 8 min.	
2.3	3 hrs. 25 min.	
2.4	3 hrs. 15 min.	Died out of order
2.5	3 hrs. 28 min.	

END-POINT.

As our former experiments showed that dilutions of the drug of sufficient strength to cause the death of the fish in about 3 hours gave more concordant results than dilutions which caused death in 1 hour, our next problem was to determine the best end-point.

We therefore made a comparison between the results obtained with dilutions of the drug of sufficient strength to kill within 1 to 3 hours, 3 to 10 hours and 18 to 24 hours with the object of determining at which time limit the test is the most sensitive.

Exhaustive experiments involving the use of over 1,000 fish showed that the test was the most sensitive when using dilutions of the drug which produced death in approximately 3 hours.

The following three tables are characteristic of the results obtained:

TABLE V.

18 to 24 hours.

Amt. of tincture in 500 mils.	Time required to kill.	Order in which fish should have died.	Order in which fish died.	Remarks.
1.0	21 hrs. 20 min.	1	4	Died out of order
0.9	18 hrs. 25 min.	2	2	
0.8	36 hrs. 15 min.	3	6	Died out of order
0.7	19 hrs. 55 min.	4	3	Died out of order
0.6	23 hrs.	5	5	Died out of order
0.5	17 hrs. 47 min.	6	1	Died out of order
0.4	41 hrs.	7	7	

Temperature 22° C.

TABLE VI.

3 to 10 hours.

Amt. of tincture in 500 mils.	Time required to kill.	Order in which fish should have died.	Order in which fish died.	Remarks.
1.3	9 hrs. 17 min.	7	7	
1.5	5 hrs. 55 min.	6	2	Died out of order
1.7	6 hrs. 15 min.	5	4	Died out of order
1.9	6 hrs. 25 min.	4	5	Died out of order
2.0	6 hrs. 10 min.	3	3	
2.1	7 hrs. 10 min.	2	6	Died out of order
2.3	3 hrs. 40 min.	1	1	

TABLE VII.

1 to 3 hours.

2.3	3 hrs. 50 min.	15	15	
2.4	3 hrs. 42 min.	14	14	
2.5	3 hrs. 38 min.	13	13	
2.6	3 hrs.	12	11	Died out of order
2.7	3 hrs. 30 min.	11	12	
2.8	2 hrs. 55 min.	10	10	
2.9	2 hrs. 45 min.	9	9	
3.0	2 hrs. 34 min.	8	7	Died out of order
3.1	2 hrs. 39 min.	7	8	
3.2	2 hrs. 35 min.	6	6	
3.3	1 hr. 31 min.	5	2	Died out of order
3.4	2 hrs. 28 min.	4	5	
3.5	2 hrs. 10 min.	3	4	
3.6	1 hr. 59 min.	2	3	
3.7	1 hr. 52 min.	1	1	

Temperature 22° C.

It will be noted by Table V that five out of seven fish died "out of order" and that in Table VI four out of seven fish died "out of order," whereas in Table VII only three out of fifteen fish "died out of order." It is apparent, therefore, that the best results are obtained by dilutions of the drug of such strength that they will produce death within 3 hours. We accordingly adopted *3 hours as our time limit.*

TENTATIVE STANDARD.

Having decided as to the most satisfactory temperature and end-point, we are in a position to determine the amount of tincture digitalis of U. S. P. standard strength required to kill within the time limit, thus procuring the necessary data upon which to base a tentative standard.

Accordingly we adjusted a tincture of digitalis to standard U. S. P. strength by the "one hour frog method," after which we tested it upon gold fish, with the following results:

TABLE VIII.

Amt. tinct. digitalis in 500 mils.	Temperature.	Results at end of 3 hours.
2.65	22° C.	Alive
2.7	22° C.	Alive
2.75	22° C.	Alive
2.8	22° C.	Alive
2.85	22° C.	Dead
2.9	22° C.	Dead
2.95	22° C.	Dead
3.0	22° C.	Dead
3.1	22° C.	Dead

TABLE IX.

Amt. tinct. digitalis in 500 mils.	Temperature.	Results atend of 3 hours
2.7 mils	22° C.	Alive
2.7 mils	22° C.	Alive
2.7 mils	22° C.	Alive
2.7 mils	22° C.	Died
2.7 mils	22° C.	Alive
2.8 mils	22° C.	Died
2.8 mils	22° C.	Recovered
2.8 mils	22° C.	Died
2.8 mils	22° C.	Died
2.8 mils	22° C.	Recovered
2.8 mils	22° C.	Recovered
2.8 mils	22° C.	Died
2.85 mils	22° C.	Died
2.85 mils	22° C.	Died
2.85 mils	22° C.	Died
2.85 mils	22° C.	Died
2.85 mils	22° C.	Died
2.9 mils	22° C.	Died
2.9 mils	22° C.	Died

As a result of these experiments we adopted *2.85 mils as our tentative standard* as it will be noted that it is the smallest amount which will in practically every case cause the death of the fish within 3 hours.

ADOPTED METHOD.

The foregoing experiments led us to adopt a method which consists in determining the minimum amount of tincture of digitalis which in 500 mils of "tap-water" will prove fatal to gold fish within 3 hours, the fish being immersed in the solution which is kept at a constant temperature of 22° C.

The details of the method are as follows:

APPARATUS NECESSARY FOR EXPERIMENT.

Constant temperature bath,[1] 800 mil beakers, 500 mil volumetric flask, 10 mil pipette graduated in tenths and a 2 mil pipette graduated in hundredths.

Animals.—Common gold fish about $2^1/_2$ to 3 inches in length, in good healthy condition.

Preparation of Experiment.—Adjust constant temperature bath so that it maintains a temperature of 22° C. Wash and thoroughly dry six 800 mil beakers and label 1 to 6, respectively; accurately pipette to the hundredth of a mil, $^7/_{10}$ of the standard dose into the 500 mil volumetric flask and fill to the *mark* with "tap-water;" shake thoroughly and empty into beaker No. 1; five other solutions are similarly prepared containing $^8/_{10}$, $^9/_{10}$, $^{10}/_{10}$, $^{11}/_{12}$ and $^{12}/_{12}$, respectively, of the standard, and placed in the beakers 2 to 6, respectively; all six beakers are then placed in the constant temperature bath, together with another larger beaker containing 6 gold fish in plain "tap-water."

Actual Standardization.—After one hour the fish are removed from the large beaker and one is placed in each of the six beakers containing the various dilutions

[1] Pittenger, J. A. PH. A., Nov. 1916. p. 1261.

of the drug. In removing the fish from the "tap-water" to the drugged solution, care should be exercised that no water be transferred with them. Note the time that the fish are placed in the drugged solutions. Maintain constant temperature of 22° C. After 3 hours note should be made of those living and those which are dead.

The results of this preliminary test, in which the range of dosage is quite wide, enables the investigator to form some idea as to the strength of the preparation. Basing the dosage upon these results, other series of dilutions are made by progressively increasing or decreasing the strength of the dilutions, as the case may be, still further diminishing the variation between doses, until the smallest amount of tincture in 500 mils of water is found which will prove fatal within 3 hours.

The probable M. L. D. (minimum lethal dose) of the preparation, unless it deviates considerably from that of the standard, is generally obtained by one or two series of dilutions.

In order to determine whether or not this is the true M. L. D. this result is checked by carefully preparing a new series of four dilutions; two with the smallest amount of tincture which was found to kill and two with the largest amount of tincture which did not kill. If, however, any of this last series show irregularities, further correction must be made.

After thus determining the M. L. D. of the preparation its relative strength can be calculated by comparing the M. L. D. of the unknown with the standard M. L. D. of 2.85 by simple proportion.

It will be observed from Tables VIII and IX that this method is sensitive to variations of less than 2 percent in the strength of the dilutions of digitalis in which the fish are placed.

In our former contribution we stated:

> "It would appear from the above results that alcohol to the extent of that contained in the U. S. P. tincture does not affect the results. More extensive experiments, however, are necessary before definite conclusions may be drawn in regard to this point."

In order to arrive at a definite conclusion in regard to the effect of alcohol on the results we divided a tincture of digitalis into two portions. We then evaporated the one portion on a steam bath until it was freed from practically all of its alcohol, after which it was restored to its original volume with tap-water.

The two portions were then tested simultaneously with the following results:

TABLE X.

TINCTURE DIGITALIS.

70% alcohol.

Amt. of tincture in 500 mils.	Temperature.	Results after 3 hours.
2.5	22° C.	Recovered
2.6	22° C.	Recovered
2.7	22° C.	Recovered
2.8	22° C.	Recovered
2.85	22° C.	Died
2.9	22° C.	Died

M. L. D. = 2.85.

TABLE XI.

TINCTURE DIGITALIS.

Alcohol Removed.

Amt. of tincture in 500 mils.	Temperature.	Results after 3 hours.
2.5	22° C.	Recovered
2.6	22° C.	Recovered
2.7	22° C.	Recovered
2.8	22° C.	Recovered
2.85	22° C.	Died
2.9	22° C.	Died

M. L. D. = 2.85.

It will be noted that the above results confirm our former conclusions that *alcohol to the extent of that contained in the U. S. P. tincture does not affect the results.*

As a result of our experimental work to date we have arrived at the following conclusions:

1. Variations of less than 2 percent in the strength of tincture of digitalis can be accurately determined by the method outlined.

2. Variations due to difference in the rate of absorption appear to be practically eliminated by the use of these animals.

3. The weight of the fish may be disregraded when making tests by this method.

4. Variations in temperature markedly influence the resistance of gold fish to digitalis poisoning.

5. The individual variations in susceptibility of gold fish is much less than that in guinea pigs and frogs.

6. The gold fish method is unquestionably the simplest so far proposed and can easily be carried out by those not especially skilled in the pharmacodynamic art.

7. The inexpensiveness of the assay is decidedly in its favor. Gold fish of the proper size can be purchased wholesale for from 45 to 60 cents per dozen.

8. A sufficient number of animals can be procured at all seasons of the year.

9. Alcohol to the extent of that contained in the U. S. P. tincture does not affect the results.

10. A tincture of digitalis to be of standard strength should have a M. L. D. of 2.85 when assayed by this method.

Finally the author wishes to acknowledge his indebtedness to Mr. LeRoy Goinez for most of the laboratory work in connection with this paper.

PHARMACODYNAMIC LABORATORY,
H. K. MULFORD COMPANY,
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DIGITALIS STANDARDIZATION: A CONSIDERATION OF CERTAIN METHODS OF BIOLOGICAL ASSAY.*

BY L. W. ROWE.

The physiological standardization of the drugs comprising the digitalis series of heart tonics has received much consideration since Houghton[1] proposed the first method for the assay of Strophanthus preparations in 1898.

One of the more recent of the methods proposed for standardizing digitalis preparations and one which constantly appears to be receiving consideration is

*Read before the Scientific Section, A. Ph. A., New York Meeting, 1919.

the cat method, which was suggested by Hatcher and Brody[2] in 1909. In this method the digitalis preparation, suitably diluted, is administered intravenously to an anesthetized cat. The degree of dilution and size of dose are such that when slowly injected the animal will be killed within 90 minutes. The result gives the M. L. D. based on the amount of the preparation necessary per kilogramme body weight of cat.

Several objections have been raised to the use of this method, the chief one being that the death of the cat is not always caused by the action of the digitalis on the heart since respiration often ceases before the heart stops beating. Other objections are the irregularity in time of death of the test animal and the difficulty in obtaining a sufficient number of cats and in handling them.

The experiments reported in this paper were carried out, first, to determine whether any relationship exists between the results of assays by the cat and frog methods; second, to determine the accuracy of the cat method, and third, to suggest certain modifications of the method, in order to make it more practical for commercial assay work.

A search of the literature reveals the fact that very little experimental work with the cat method has been reported except by Hatcher and his co-worker, Eggleston. Eckler's[3] work published in 1912 on this subject seems to prove that the heart of the cat stops beating before respiration ceases. The number of samples tested, however, is too small to prove whether the method is suitable for commercial testing. Rowntree and Macht[4] in their work by this method have recently suggested certain changes which seem to improve it. The rate of injection used by Rowntree and Macht is the most important of these changes and has been adopted in my experiments.

In a later publication, Hatcher[5] enumerates certain features which he claims as distinct advantages, namely, elimination of absorption, speed of obtaining results, ease of handling animals and small comparative cost of assay. The method of administration certainly eliminates the question of absorption which is an important factor in the U. S. P. frog method. The most important consideration, however, in selecting a method of assay is accuracy; this and cost involved in obtaining and handling cats is open to question.

While results can be obtained more rapidly than by the M. L. D. frog method, it is doubtful if it is shorter than the official frog method. Most pharmacologists will agree that cats are not as easy to work with as other animals but a suggestion will be made later which has seemed to facilitate the handling of the cats. As to the expense involved, the test animals cost 75 cents instead of 10 cents, as Hatcher states, and then cannot be obtained in sufficient numbers for ordinary experimental purposes. Raising cats is also very unprofitable and our experience confirms that of Eckler[3] on this phase of the subject.

Eggleston's[6] work on the comparison of clinical results apparently established a ratio between the M. L. D. for cats and the dosage for man by carrying out clinical experiments in conjunction with his cat assays. It does not seem necessary, however, that results be transferable from the test animal to man in choosing a physiological method of assay, but other things being equal it is a point in favor of the cat method.

In my first experiments with the cat method, I attempted to kill the animal

in as nearly 90 minutes as possible just as Eckler did in his experiments. Later experiments showed, however, that much more uniform results could be obtained if the end-point was reached in from 20 to 45 minutes with 30 minutes as a good average. Also, in the first experiments the solutions were injected at a uniform rate from the beginning to the death of the animal. Injecting rapidly at first and then giving 1 mil every two minutes thereafter until the death of the animal is a better procedure.

In practically all of the experiments chloretone[7] was used as the anesthetic. It is easily given, is rapid in its action and in every respect is very satisfactory. This is a very important point in the use of cats as the injection is given so easily and the action is so rapid and pronounced. For cats the solution used is only half as strong as that suggested for completely anesthetizing dogs since a dose of 0.15 Gm. to 0.20 Gm. of chloretone per Kg. body weight is sufficient, when injected intraperitoneally, to produce a satisfactory anesthesia which does not effect the heart or depress the respiratory center, and requires no further administration of anesthetic after the first dose. The use of chloretone entirely eliminates the trouble experienced in administering anesthetics to cats, with the attendant danger of giving too much, though of course, it does not overcome the other difficulty of working with these animals, namely, the insertion of a cannula into the small femoral vein. If chloretone is used as the anesthetic the only physical objections to the use of the cat as the test animal is the difficulty and even impossibility of obtaining them in sufficient numbers for assay purposes and the trouble of working with the small and delicate blood vessels of this animal.

Because of the greater convenience in using dogs rather than cats as well as the further advantages that dogs are more easily obtained and cheaper, I have made a series of tests of a number of samples, using the cat and the dog in the modified intravenous method, and comparing the activities thus obtained with the test of the sample by the minimum lethal dose frog method. The technique of the injection used in the later experiments which is preferable to that of Hatcher, is that of Rowntree and Macht, in which approximately one-half of the calculated amount is injected at the rate of 3 mils per minute and the rest at the rate of 1 mil every two minutes. In the case of digitalis, ouabain was not used to complete the reaction, as originally suggested by Hatcher. By using a larger dose, results equally as accurate can be obtained without the additional complication.

The dilutions chosen for injection should be such that the M. L. D. for cats is between 10 and 25 mils; for dogs between 20 and 50 mils, 18 mils being a good average total dose for cats and 25 to 30 mils being a good average total dose for dogs.

The following tables of data give the results of tests of 18 samples upon 61 cats and of 30 samples upon 132 dogs:

TABLE I.—EXPERIMENTS WITH CATS.

OUABAIN "A."

Cat No.	Sex.	Cond.	Weight.	Anes.	Dil. of sample.	Total dose.	Time to kill.	M. L. D. per Kg.
1	M	Good	2.12 Kg.	Deep	1 : 20000	3.9 mils	60 min.	0.092 mg.
2*	M	Good	2.72 Kg.	Deep	1 : 20000	6.4 mils	90 min.	0.1176 mg.
3	M	Good	2.47 Kg.	Deep	1 : 20000	4.7 mils	82 min.	0.095 mg.
5	F	Good	3.74 Kg.	Deep	1 : 20000	6.5 mils	75 min.	0.087 mg.
6*	M	Fair	1.73 Kg.	None given	1 : 20000	4.4 mils	50 min.	0.127 mg.

Average M. L. D. per Kg. = 0.091 mg.

TABLE I.—EXPERIMENTS WITH CATS (*Continued*).

Cat No.	Sex.	Cond.	Weight.	Anes.	Dil. of sample.	Total dose.	Time to kill.	M. L. D. per Kg.
OUABAIN "B."								
10	F	Fair	1.36 Kg.	Deep	1 : 50000	8.75 mils	46 min.	0.128 mg.
11	M	Good	2.1 Kg.	Light	1 : 50000	11.5 mils	33 min.	0.109 mg.
12	F	Good	2.82 Kg.	Deep	1 : 50000	18.5 mils	41 min.	0.131 mg.
13*	F	Poor (kitten)	0.86 Kg.	Deep	1 : 50000	11.6 mils	38 min.	0.270 mg.
15*	M	Fair (kitten)	1.94 Kg.	Deep	1 : 50000	14.7 mils	36 min.	0.151 mg.
16*	F	Poor (kitten)	1.41 Kg.	Deep	1 : 50000	12.4 mils	48 min.	0.175 mg.
Average M. L. D. per Kg. = 0.123 mg.								
OUABAIN "C."								
17	F	Good	2.74 Kg.	Deep	1 : 50000	21.9 mils	58 min.	0.160 mg.
18	M	Good	2.84 Kg.	Deep	1 : 50000	19.2 mils	65 min.	0.135 mg.
19	F	Poor	0.88 Kg.	Deep	1 : 100000	12.8 mils	40 min.	0.145 mg.
Average M. L. D. per Kg. = 0.147 mg.								
STROPHANTHIN (KOMBE) SAMPLE NO. 256490.								
51	F	Good	2.40 Kg.	Fair	1 : 30000	15.0 mils	18 min.	0.228 mg.
52	F	Good	3.20 Kg.	Fair	1 : 30000	16.0 mils	16 min.	0.166 mg.
53	F	Good	2.70 Kg.	Fair	1 : 30000	15.0 mils	20 min.	0.185 mg.
Average M. L. D. per Kg. = 0.186 mg.								
TINCTURE OF STROPHANTHUS U. S. P. 1890.								
20	F	Good	2.28 Kg.	Deep	1 : 100	13.3 mils	87 min.	0.059 mil
21	F	Good	2.60 Kg.	Deep	1 : 200	25.3 mils	47 min.	0.049 mil
22	F	Good	2.50 Kg.	Deep	1 : 100	14.1 mils	30 min.	0.056 mil
23	M	Fair	1.24 Kg.	Deep	1 : 100	6.44 mils	27 min.	0.052 mil
44*	M	Good	3.66 Kg.	Fair	1 : 100	26.0 mils	36 min.	0.071 mil
Average M. L. D. per Kg. = 0.054 mil.								
TINCTURE OF DIGITALIS FROM DRUG NO. 250139.								
24*	M	Good	2.00 Kg.	Deep	1 : 10	27.5 mils	30 min.	1.38 mils
25	M	Fair	1.40 Kg.	Deep	1 : 10	13.5 mils	21 min.	0.96 mils
26	F	Good	1.94 Kg.	Deep	1 : 10	18.2 mils	30 min.	0.94 mils
27	F	Good	2.16 Kg.	Deep	1 : 10	22.0 mils	60 min.	1.02 mils
Average M. L. D. per Kg. = 0.97 mil.								
TINCTURE OF DIGITALIS "A."								
36	F	Good	2.92 Kg.	Deep	1 : 4	30.2 mils	30 min.	2.58 mils
TINCTURE OF DIGITALIS "B."								
37*	M	Good	4.48 Kg.	Fair	1 : 4	27.0 mils	32 min.	1.50 mils
38	M	Good	3.00 Kg.	Light	1 : 5	21.0 mils	28 min.	1.40 mils
42	M	Small O. K.	1.60 Kg.	Light	1 : 5	11.0 mils	12 min.	1.38 mils
Average M. L. D. per Kg. = 1.40 mils.								
TINCTURE OF DIGITALIS "C."								
39	F	Good	2.76 Kg.	Fair	1 : 5	15.0 mils	15 min.	1.09 mils
40	M	Good	2.75 Kg.	Fair	1 : 5	19.0 mils	25 min.	1.38 mils
41	M	Good	3.00 Kg.	Fair	1 : 5	19.0 mils	24 min.	1.27 mils
43	F	Good	3.35 Kg.	Light	1 : 5	23.0 mils	22 min.	1.37 mils
Average M. L. D. per Kg. = 1.28 mils.								

TABLE I.—EXPERIMENTS WITH CATS (*Continued*).

DIGITALONE NO. 046798.

Cat No.	Sex.	Cond.	Weight.	Anes.	Dil. of sample.	Total dose.	Time to kill.	M. L. D. per Kg.
34	F	Good	2.00 Kg.	Deep	1 : 10	17.9 mils	27 min.	0.90 mil

FLUIDEXTRACT OF DIGITALIS, ℞ NO. 665561.

48	F	Good	2.00 Kg.	Light	1 : 50	14.0 mils	14 min.	0.140 mil
49	M	Good	3.86 Kg.	Light	1 : 50	33.0 mils	37 min.	0.171 mil
50	F	Good	2.30 Kg.	Fair	1 : 50	15.0 mils	15 min.	0.130 mil

Average M. L. D. per Kg. = 0.147 mil.

FLUIDEXTRACT OF SQUILL, ℞ NO. 681685.

45	M	Good	2.25 Kg.	Fair	1 : 50	13.0 mils	15 min.	0.115 mil
46	F	Good	2.35 Kg.	Fair	1 : 60	16.0 mils	20 min.	0.113 mil
47	F	Good	2.50 Kg.	Very light	1 : 60	16.0 mils	18 min.	0.107 mil

Average M. L. D. per Kg. = 0.112 mil.

Asterisk after number of experimental animal means that result was not used in determining average.

TABLE II.—EXPERIMENTS WITH DOGS.

OUABAIN "A."

Dog No.	Sex.	Cond.	Weight.	Anes.	Dil. of sample.	Total dose.	Time to kill.	M. L. D. per Kg.
1	F	Good*	7.05 Kg.	Deep	1 : 20000	16.5 mils	97 min.	0.117 mg.
2*	F	Good*	10.5 Kg.	Deep	1 : 40000	50.0 mils	Not fatal	
3	M	Good*	18.5 Kg.	Deep	1 : 20000	37.5 mils	85 min.	0.101 mg.

Average M. L. D. per Kg. = 0.109 mg.

OUABAIN "B."

4	F	Good*	9.1 Kg.	Deep	1 : 25000	33.4 mils	57 min.	0.147 mg.
5	F	Good*	11.9 Kg.	Deep	1 : 20000	26.25 mils	60 min.	0.110 mg.
6*	M	Good*	12.05 Kg.	Deep	1 : 25000	48.2 mils	40 min.	0.160 mg.
7	F	Good	16.4 Kg.	Deep	1 : 20000	39.9 mils	38 min.	0.121 mg.

Average M. L. D. per Kg. = 0.126 mg.

OUABAIN "C."

11	M	Good*	9.0 Kg.	Deep	1 : 25000	28.6 mils	35 min.	0.127 mg.
12*	M	Fair*	7.0 Kg.	Deep	1 : 25000	28.8 mils	65 min.	0.165 mg.
13	M	Good*	9.5 Kg.	Deep	1 : 25000	33.0 mils	45 min.	0.139 mg.
14	F	Good*	17.2 Kg.	Deep	1 : 20000	50.0 mils	45 min.	0.145 mg.
15	F	Fair	6.0 Kg.	Deep	1 : 25000	30.4 mils	50 min.	0.136 mg.
16	M	Good*	9.0 Kg.	Deep	1 : 25000	33.5 mils	30 min.	0.149 mg.

Average M. L. D. per Kg. = 0.139 mg.

STROPHANTHIN (KOMBE) NO. 183774.

21*	M	Good*	8.5 Kg.	Deep	1 : 10000	29.1 mils	45 min.	0.343 mg.
22	F	Good*	10.8 Kg.	Deep	1 : 10000	29.4 mils	20 min.	0.273 mg.
24*	M	Good*	13.4 Kg.	Deep	1 : 10000	50.0 mils	Not fatal	
25	F	Good*	15.0 Kg.	Deep	1 : 10000	36.4 mils	26 min.	0.242 mg.
30	F	Good*	8.2 Kg.	Deep	1 : 10000	20.5 mils	36 min.	0.250 mg.

Average M. L. D. per Kg. = 0.255 mg.

STROPHANTHIN (KOMBE) NO. 256490.

98	M	Good	9.2 Kg.	Light	1 : 15000	35.0 mils	25 min.	0.253 mg.
99	F	Good*	12.8 Kg.	Fair	1 : 15000	45.0 mils	12 min.	0.234 mg.
100	M	Good	10.0 Kg.	Fair	1 : 15000	37.0 mils	28 min.	0.247 mg.
101*	M	Good*	14.4 Kg.	Deep	1 : 10000	41.0 mils	18 min.	0.284 mg.

Average M. L. D. per Kg. = 0.245 mg.

TABLE II.—EXPERIMENTS WITH DOGS (*Continued*).

STROPHANTHIN (KOMBE) NO. 256491.

Dog. No.	Sex.	Cond.	Weight.	Anes.	Dil. of sample.	Total dose.	Time to kill.	M. L. D. per Kg.
86*	F	Good	7.56 Kg.	Fair	1 : 15000	32.0 mils	33 min.	0.282 mg.
89*	M	Good*	7.6 Kg.	Deep	1 : 15000	37.0 mils	35 min.	0.324 mg.
90*	F	Good	7.1 Kg.	Fair	1 : 15000	30.0 mils	20 min.	0.282 mg.
91	F	Good	8.4 Kg.	Deep	1 : 15000	30.0 mils	17 min.	0.238 mg.
92	M	Good	9.2 Kg.	Deep	1 : 15000	33.0 mils	24 min.	0.239 mg.
93	F	Good	10.5 Kg.	Light	1 : 15000	36.0 mils	20 min.	0.228 mg.

Average M. L. D. per Kg. = 0.235 mg.

TINCTURE OF STROPHANTHUS U. S. P. 1890.

17	M	Good	7.94 Kg.	Deep	1 : 50	27.0 mils	35 min.	0.068 mil
18*	F	Good	*19.5 Kg.	Deep	1 : 25	19.2 mils	28 min.	0.039 mil
19	F	Good*	10.45 Kg.	Deep	1 : 50	26.5 mils	38 min.	0.051 mil
20*	M	Good*	14.10 Kg.	Deep	1 : 50	26.8 mils	40 min.	0.038 mil
23*	M	Good*	16.7 Kg.	Deep	1 : 50	35.0 mils	60 min.	0.042 mil
74	M	Good*	9.8 Kg.	Fair	1 : 50	27.0 mils	32 min.	0.055 mil
75	M	Good*	13.1 Kg.	Deep	1 : 50	46.0 mils	53 min.	0.070 mil
76	F	Good*	10.7 Kg.	Deep	1 : 50	34.0 mils	36 min.	0.064 mil
77	F	Good*	8.3 Kg.	Deep	1 : 50	21.0 mils	37 min.	0.051 mil
78	M	Good*	17.5 Kg.	Light	1 : 50	47.0 mils	42 min.	0.054 mil
79	F	Good*	11.1 Kg.	Light	1 : 50	34.0 mils	31 min.	0.061 mil
83	M	Good*	19.0 Kg.	Deep	1 : 40	44.0 mils	45 min.	0.058 mil
84	M	Good*	15.2 Kg.	Deep	1 : 50	44.0 mils	38 min.	0.058 mil
106	M	Good*	10.4 Kg.	Deep	1 : 50	32.0 mils	31 min.	0.062 mil

Average M. L. D. per Kg. = 0.059 mil.

TINCTURE OF STROPHANTHUS, U. S. P. 1910, ℞ 86068.

63	M	Good*	20.7 Kg.	Deep	1 : 50	32.0 mils	31 min.	0.031 mil
64	M	Good	13.6 Kg.	Fair	1 : 50	21.0 mils	32 min.	0.031 mil
65	M	Good	15.0 Kg.	Fair	1 : 50	22.0 mils	20 min.	0.030 mil
66	M	Fair	14.2 Kg.	Light	1 : 50	23.0 mils	36 min.	0.032 mil

Average M. L. D. per Kg. = 0.031 mil.

TINCTURE OF STROPHANTHUS, 1910, ℞ 683866

118	M	Good	14.0 Kg.	Fair	1 : 50	15.0 mils	18 min.	0.021 mil
119	M	Good	10.2 Kg.	Fair	1 : 75	20.0 mils	25 min.	0.026 mil
120*	M	Fair*	6.75 Kg.	Deep	1 : 75	14.0 mils	14 min.	0.0276 mil
121	F	Good*	12.0 Kg.	Fair	1 : 100	25.0 mils	20 min.	0.021 mil

Average M. L. D. per Kg. = 0.0227 mil.

TINCTURE OF DIGITALIS FROM DRUG NO. 250139.

26	M	Good*	9.75 Kg.	Deep	1 : 2	35.0 mils	86 min.	1.14 mils

TINCTURE OF DIGITALIS, ℞ 674678.

31	F	Good*	9.75 Kg.	Deep	1 : 2	37.8 mils	42 min.	1.94 mils
32	M	Good*	7.07 Kg.	Light	1 : 25	34.5 mils	30 min.	1.95 mils
33*	F	Poor	4.75 Kg.	Light	1 : 3	31.0 mils	57 min.	2.18 mils

Average M. L. D. per Kg. = 1.95 mils.

TINCTURE OF DIGITALIS "A."

35*	M	Good*	10.5 Kg.	Deep	1 : 2	42.0 mils	50 min.	2.0 mils
36	M	Good*	7.2 Kg.	Deep	1 : 3	59.0 mils	80 min.	2.73 mils
37	F	Good	7.75 Kg.	Fair	1 : 3	67.5 mils	85 min.	2.90 mils
38	M	Good	7.1 Kg.	Fair	1 : 2	44.0 mils	68 min.	3.09 mils

Average M. L. D. per Kg. = 2.91 mils.

TABLE II.—EXPERIMENTS WITH DOGS (*Continued*).

TINCTURE OF DIGITALIS, ℞ 676593.

Dog No.	Sex.	Cond.	Weight.	Anes.	Dil. of sample.	Total dose.	Time to kill.	M. L. D. per Kg.
49	F	Good*	8.8 Kg.	Fair	1 : 3	32.0 mils	50 min.	1.21 mils
50	M	Good*	10.7 Kg.	Deep	1 : 3	36.3 mils	50 min.	1.13 mils
Average M. L. D. per Kg. = 1.17 mils.								

TINCTURE OF DIGITALIS, ℞ 676593 (ADJUSTED).

52*	F	Good*	9.0 Kg.	Deep	1 : 3	45.0 mils	40 min.	1.66 mils
53	F	Good	6.1 Kg.	Light	1 : 3	33.0 mils	62 min.	1.80 mils
54*	F	Good*	10.0 Kg.	Deep	1 : 3	47.6 mils	27 min.	1.59 mils
56	F	Good	8.3 Kg.	Fair	1 : 3	49.0 mils	50 min.	1.97 mils
57	F	Good	9.65 Kg.	Fair	1 : 3	57.0 mils	58 min.	2.00 mils
Average M. L. D. per Kg. = 1.92 mils.								

TINCTURE OF DIGITALIS "B".

59	F	Good	6.9 Kg.	Fair	1 : 3	29.0 mils	33 min.	1.40 mils
85*	F	Very Poor	5.0 Kg.	Light	1 : 3	30.0 mils	42 min.	2.00 mils
87	F	Good	11.4 Kg.	Fair	1 : 3	50.0 mils	48 min.	1.46 mils
88*	F	Poor	5.8 Kg.	Fair	1 : 3	34.0 mils	36 min.	1.95 mils
No. 85 had distemper and No. 88 was mangy and emaciated. Average M. L. D. per Kg. = 1.43 mils.								

TINCTURE OF DIGITALIS "C".

60	M	Good*	12.1 Kg.	Deep	1 : 3	45.0 mils	40 min.	1.24 mils
61	M	Good	9.55 Kg.	Light	1 : 3	37.0 mils	37 min.	1.29 mils
62	F	Small*	7.9 Kg.	Deep	1 : 3	27.0 mils	20 min.	1.14 mils
Average M. L. D. per Kg. = 1.22 mils.								

TINCTURE OF DIGITALIS, ℞ C136053.

114*	M	Good*	11.0 Kg.	Deep	Undil.	14.0 mils	24 min.	1.27 mils
115	M	Good	13.6 Kg.	Deep	Undil.	21.0 mils	30 min.	1.54 mils
116	M	Good	7.75 Kg.	Fair	1 : 2	32.0 mils	46 min.	1.83 mils
117	M	Good*	14.6 Kg.	Deep	Undil.	22.0 mils	28 min.	1.50 mils
Average M. L. D. per Kg. = 1.62 mils.								

DIGITALONE, NO. 046798.

27	M	Good*	6.8 Kg.	Deep	1 : 3	31.5 mils	105 min.	1.54 mils
28	M	Good*	8.8 Kg.	Fair	1 : 2	29.5 mils	70 min.	1.67 mils
29	M	Good*	9.4 Kg.	Deep	1 : 2	26.0 mils	30 min.	1.38 mils
Average M. L. D. per Kg. = 1.53 mils.								

DIGITALONE, NO. 049780.

107	F	Good*	9.7 Kg.	Deep	Undil.	17.0 mils	20 min.	1.75 mils
108	M	Good*	13.35 Kg.	Fair	Undil.	23.0 mils	30 min.	1.72 mils
110	M	Good	8.8 Kg.	Light	1 : 2	32.0 mils	27 min.	1.81 mils
Average M. L. D. per Kg. = 1.76 mils.								

FLUIDEXTRACT OF DIGITALIS, ℞ 665561.

68	F	Good*	12.9 Kg.	Fair	1 : 20	47.0 mils	50 min.	0.186 mil
69	M	Good*	16.5 Kg.	Deep	1 : 10	29.0 mils	25 min.	0.176 mil
70*	M	Good	8.45 Kg.	Light	1 : 20	40.0 mils	52 min.	0.236 mil
71	M	Good	17.8 Kg.	Deep	1 : 10	31.0 mils	30 min.	0.174 mil
72	F	Small	6.25 Kg.	Light	1 : 20	25.0 mils	29 min.	0.200 mil
Average M. L. D. per Kg. = 0.183 mil.								

SOLID EXTRACT OF DIGITALIS, ℞ 661579.

80	M	Good*	20.0 Kg.	Fair	1 : 30	34.0 mils	48 min.	0.057 mil
81	F	Good	10.0 Kg.	Deep	1 : 50	35.0 mils	50 min.	0.070 mil
82	M	Good*	14.7 Kg.	Deep	1 : 30	26.0 mils	35 min.	0.059 mil
Average M. L. D. per Kg. = 0.062 Gm.								

TABLE II.—EXPERIMENTS WITH DOGS (*Continued*).

FLUIDEXTRACT OF SQUILL, ℞ 675384.

Dog No.	Sex.	Cond.	Weight.	Anes.	Dil. of sample.	Total dose.	Time to kill.	M. L. D. per Kg.
39*	F	Good*	13.0 Kg.	Deep	1 : 10	24.0 mils	65 min.	0.185 mil
40	M	Good	9.0 Kg.	Deep	1 : 15	21.2 mils	30 min.	0.156 mil
41*	F	Good*	11.2 Kg.	Deep	1 : 15	31.1 mils	48 min.	0.184 mil
42	F	Good	10.7 Kg.	Deep	1 : 15	25.8 mils	41 min.	0.160 mil
43*	F	Good*	13.5 Kg.	Deep	1 : 15	30.0 mils	34 min.	0.148 mil
44	M	Good	7.3 Kg.	Very light	1 : 15	17.0 mils	32 min.	0.156 mil
45	F	Good	9.0 Kg.	Very light	1 : 15	22.0 mils	60 min.	0.163 mil
48*	F	Good*	12.8 Kg.	Deep	1 : 15	36.3 mils	35 min.	0.190 mil
	Average M. L. D. per Kg. = 0.159 mil.							

FLUIDEXTRACT OF SQUILL, ℞ 681685.

102	F	Good	15.9 Kg.	Deep	1 : 10	28.0 mils	20 min.	0.176 mil
103*	M	Poor	14.25 Kg.	Deep	1 : 10	20.0 mils	12 min.	0.140 mil
104	F	Fair	8.7 Kg.	Fair	1 : 20	28.0 mils	32 min.	0.161 mil
105	M	Good	10.0 Kg.	Deep	1 : 15	24.0 mils	19 min.	0.160 mil
109	F	Good	7.8 Kg.	Light	1 : 20	24.0 mils	27 min.	0.154 mil
	Average M. L. D. per Kg. = 0.163 mil.							

FLUIDEXTRACT OF SQUILL, ℞ C134342.

55	M	Good*	14.5 Kg.	Deep	1 : 20	31.5 mils	27 min.	0.108 mil
58	M	Good*	12.6 Kg.	Deep	1 : 20	31.0 mils	36 min.	0.123 mil
	Average M. L. D. per Kg. = 0.115 mil.							

Asterisk after number of experimental animal means that result was not used in determining average.

In Table II asterisk after condition of dog means that animal had been used prior to the test of the heart tonic.

Tables I and II give in as concise a form as possible all of the data which is necessary to a critical analysis of the results reported. An attempt was made to test a variety of preparations and yet to test several different samples of each type. The results are summarized in the following Tables III and IV:

TABLE III.—COMPARISON OF AVERAGE M. L. D. TO CATS AND DOGS.

Sample.	Cats. M. L. D. per Kg.	Dogs. M. L. D. per Kg.	Ratio.
Ouabain "A"	0.092 mg.	0.109 mg.	1 to 1.2
Ouabain "B"	0.123 mg.	0.126 mg.	1 to 1.02
Ouabain "C"	0.147 mg.	0.139 mg.	1 to 0.96
Ouabain "D"	0.134 mg.	0.151 mg.	1 to 1.12
Strophanthin			
No. 256490	0.186 mg.	0.245 mg.	1 to 1.31
No. 256491		0.235 mg.	
No. 183774		0.255 mg.	
Tr. Strophanthus			
U. S. P. 1890	0.054 mil	0.059 mil	1 to 1.09
℞ 86068		0.031 mil	
℞ 681309	0.0179 mil	0.0263 mil	1 to 1.47
℞ 683866	0.0179 mil	0.0227 mil	

Sample.	Cats. M. L. D. per Kg.	Dogs. M. L. D. per Kg.	Ratio.
Tr. Digitalis			
No. 250139	0.97 mil	1.14 mils	1 to 1.17
℞ 674678		1.95 mils	
"A"	2.58 mils	2.91 mils	1 to 1.12
℞ 676593		1.17 mils	
℞ 676593 (Adj.)		1.92 mils	
"B"	1.40 mils	1.43 mils	1 to 1.02
"C"	1.28 mils	1.22 mils	1 to 0.95
"D"	1.56 mils	1.82 mils	1 to 1.17
℞ C136053		1.62 mils	
Digitalone			
No. 046798	0.90 mil	1.53 mils	1 to 1.7
No. 049780		1.76 mils	
F. E. Digitalis			
℞ 665561	0.147 mil	0.183 mil	1 to 1.24
S. E. Digitalis			
℞ 661579		0.062 Gm.	
F. E. Squill			
℞ 673584		0.159 mil	
℞ 681685	0.112 mil	0.163 mil	1 to 1.45
℞ 134342		0.115 mil	
Tr. Digitalis			
Unknown			
Activity	0.98 mil	0.134 mil	1 to 1.37
Tr. Strophanthus			
Unknown activity	0.0286 mil	0.0326 mil	1 to 1.14
Ouabain			
Unknown activity	0.202 mg.	0.191 mg.	1 to 0.95

TABLE IV.

Sample.	Cat units.	Dog units.	M. L. D. frog method. Heart tonic units.
Ouabain "A"	10,989	9174	201,500 (101%)
Ouabain "B"	8,130	7936	185,200 (93%)
Ouabain "C"	6,802	7194	197,600 (98%)
Ouabain "D"	7,462	6622	177,800 (89%)
Strophanthin			
No. 256490	5,376	4081	150,000 (150%)
No. 256491		4255	171,000 (171%)
Tr. Stroph.			
U. S. P. 1890	18.5	17.0	650 (50%)
℞ 86068		32.2	815 (62.7%)
℞ 681309	55.86	41.1	1500 (115%)
℞ 683866		44.0	1978 (136%)
Tr. Digitalis			
No. 250139	1.03	0.88	10.0 (166%)
℞ 674678		0.51	5.0 (83%)
"A"	0.387	0.343	2.0 (33%)
℞ 676593		0.854	8.25 (137.5%)
℞ 676593 (Adj.)		0.52	6.67 (111%)
"B"	0.71	0.70	9.52 (158%)
"C"	0.78	0.82	6.06 (101%)
"D"	0.64	0.55	5.0 (83%)
℞ 136053	0.64	0.62	9.17 (153)

Sample.	Cat units.	Dog units.	M. L. D. frog method Heart tonic units.
Digitalone			
046798	1.1	0.65	5.9 (98%)
049780		0.57	6.6 (110%)
F. E. Digitalis			
℞ 665561	6.8	5.5	72.0 (110%)
S. E. Digitalis			
℞ 661579		16.1	140.0 (70%)
F. E. Squill			
℞ 675384		6.3	120.0 (150%)
℞ 681685		6.1	100.0 (125%)
℞ 134342		8.7	140.0 (175%)
Tr. Digitalis			
Unknown activity	1.02	0.746	8.0 (133%)
Tr. Stroph.			
Unknown activity	35.0	30.4	1000 (77%)
Ouabain			
Unknown activity	4950	5235	114300 (57%)

Table III gives the average M. L. D. decided upon from the data obtained in the test of each sample upon either cats or dogs. Whenever the sample was tested upon both cats and dogs the ratio of the M. L. D. for the cat to that for the dog is placed in the fourth column. In this table it is plainly shown that there is no constant relation between the M. L. D. of a sample to cats and that of the same sample to dogs. In general, it can be stated, however, that the M. L. D. per Kg. body weight is slightly greater for the dog than for the cat.

Table IV gives the comparative results, in units, of the tests of samples upon the cat, dog and frog. The cat unit is defined by Hatcher as the amount of drug which is just sufficient to kill one kilogramme of cat when slowly and continuously injected into the vein. The number of units per gramme of the pure principles or per mil of tinctures or fluidextracts is, therefore, one divided by the average M. L. D. per Kg. as determined in the test. This exact procedure was also used in determining the number of dog units in each preparation. In the case of the M. L. D. frog test the Heart Tonic Unit is ten times the minimum lethal dose per gramme body weight of standard test frogs kept under proper test conditions. The number of heart tonic units per gram or per mil of a preparation is, therefore, one divided by 10 times the normal M. L. D. per gramme body weight of frog. The percentage which is placed in parentheses after the number of heart tonic units found for each sample is the strength of the sample in terms of the standard which has been adopted for that particular preparation.

This table (IV) shows that there is no definite relation between either the M. L. D. of a sample to the cat and M. L. D. to the frog or between the M. L. D. to the dog and that to the frog. In the case of the samples of ouabain, Sample "C" was a close second in activity to Sample "A" by the frog test while by the cat and dog tests it was a poor third. The third sample of Tr. Strophanthus was three times as active as the first sample by the *cat* test and but 2.3 times as active by the frog test. The second sample of Tincture of Strophanthus was nearly twice

as active as the first by the *dog* test while it was but $1^1/_4$ times as active by the frog test. Particularly in the tests of samples of Tincture of Digitalis are the inconsistencies of the M. L. D. to dogs plainly shown. One sample, ℞ 676593, was diluted on the basis of the original frog assay to 80 percent of its original strength and the assay of the diluted product by the M. L. D. frog test checked the dilution almost exactly while the assay of these samples upon dogs showed the diluted product to be but 60 percent as strong as the original. Several other instances of inconsistency between the results obtained upon dogs and frogs might be pointed out but they can be readily seen upon close examination of the results.

In order to arrive at the relative accuracy of the three methods in as nearly an unprejudiced a manner as possible, and to check the results reported in the preceding tables, three samples were submitted for test. They were prepared by diluting or concentrating certain lots which had been tested by all three methods but the degree of dilution or concentration was entirely unknown to the writer until after the tests were completed and results reported. Tables V and VI give the detailed reports of the tests as well as the comparison of the results obtained with the actual change which was made.

TABLE V.—ORIGINAL SAMPLES FROM WHICH UNKNOWNS WERE MADE.

TINCTURE OF STROPHANTHUS.

Test on Dogs.

Dog No.	Sex.	Cond.	Weight.	Anes.	Dil. of sample.	Total dose.	Time to kill.	M. L. D. per Kg.
94*	F	Good	12.8 Kg.	Fair	1 : 100	30.0 mils	35 min.	0.234 mil
95	M	Fair	7.2 Kg.	Fair	1 : 100	10.0 mils	26 min.	0.0277 mil
96	F	Good*	9.8 Kg.	Deep	1 : 100	26.0 mils	24 min.	0.0265 mil
97	M	Good	11.5 Kg.	Fair	1 : 100	29.0 mils	32 min.	0.0252 mil
112	F	Good*	11.6 Kg.	Deep	1 : 50	15.0 mils	14 min.	0.0259 mil

Average M. L. D. per Kg. = 0.0263 mil.

Test on Cats.

54	F	Good	2.7 Kg.	Light	1 : 250	12.0 mils	12 min.	0.0180 mil
55	F	Good	2.9 Kg.	Fair	1 : 250	13.0 mils	35 min.	0.0179 mil
56*	M	Good	3.3 Kg.	Fair	1 : 250	20.0 mils	38 min.	0.0242 mil
57	M	Good	3.75 Kg.	Fair	1 : 250	17.0 mils	25 min.	0.0180 mil
61	F	Good	2.45 Kg.	Fair	1 : 250	13.0 mils	21 min.	0.0177 mil

Average M. L. D. per Kg. = 0.0179 mil.

TINCTURE OF DIGITALIS "D."

Test on Dogs.

122*	F	Poor	8.5 Kg.	Fair	1 : 2	24 mils	30 min.	1.41 mils
123	M	Good	15.0 Kg.	Fair	1 : 2	50 mils	54 min.	1.66 mils
124	F	Good	6.1 Kg.	Fair	1 : 2	22 mils	37 min.	1.80 mils
125	M	Good	10.6 Kg.	Fair	1 : 2	41 mils	52 min.	1.93 mils
132	F	Good	9.6 Kg.	Fair	1 : 2	18 mils	35 min.	1.88 mils

Average M. L. D. per Kg. = 1.82 mils.

Tests on Cats.

64	M	Fair	1.6 Kg.	Fair	1 : 6	15 mils	36 min.	1.56 mils
65	F	Fair	2.4 Kg.	Fair	1 : 6	20 mils	40 min.	1.39 mils
66	M	Fair	3.65 Kg.	Fair	1 : 6	38 mils	60 min.	1.73 mils

Average M. L. D. per Kg. = 1.56 mils.

TABLE V.—ORIGINAL SAMPLES FROM WHICH UNKNOWNS WERE MADE (*Continued*).

OUABAIN "D."

Test on Dogs.

Dog No.	Sex.	Cond.	Weight.	Anes.	Dil. of sample.	Total dose.	Time to kill.	M. L. D. per Kg.
126	M	Good	9.9 Kg.	Fair	1 : 20000	30.0 mils	42 min.	0.151 mg.
127	F	Good	14.65 Kg.	Fair	1 : 20000	40.0 mils	35 min.	0.137 mg.
128	M	Good	17.1 Kg.	Fair	1 : 10000	28.0 mils	37 min.	0.164 mg.
129*	M	Good	12.4 Kg.	Light	1 : 10000	23.0 mils	34 min.	0.185 mg.

Average M. L. D. per Kg. = 0.151 mg.

Test on Cats.

67*	F	Kitten	1.3 Kg.	Fair	1 : 75000	17 mils	38 min.	0.174 mg.
68	F	Good	2.5 Kg.	Fair	1 : 50000	17 mils	26 min.	0.136 mg.
69*	F	Kitten	1.0 Kg.	Fair	1 : 50000	11 mils	30 min.	0.220 mg.
70	M	Good	3.05 Kg.	Fair	1 : 50000	20 mils	34 min.	0.131 mg.

Average M. L. D. per Kg. = 0.134 mg.

Samples (activity unknown at time of test).

TINCTURE OF STROPHANTHUS FROM ℞ 681309.

Test on Dogs.

135	F	14.4 Kg.	Light	1 to 50	18 mils	24 min.	0.0250 mil
136	M	11.85 Kg.	Light	1 to 50	20 mils	38 min.	0.0337 mil
139*	M	8.2 Kg.	Fair	1 to 50	18 mils	31 min.	0.0440 mil
140*	M	10.6 Kg.	Fair	1 to 50	23 mils	35 min.	0.0434 mil
141	M	17.4 Kg.	Fair	1 to 50	29 mils	40 min.	0.0330 mil
142	M	10.6 Kg.	Fair	1 to 50	17 mils	20 min.	0.0320 mil
148	M	11.0 Kg.	Fair	1 to 75	26 mils	35 min.	0.0315 mil

Average M. L. D. per Kg. = 0.0326 mil.

Test on Cats.

58	F	2.5 Kg.	Fair	1 to 250	18 mils	34 min.	0.0288 mil
59	M	3.75 Kg.	Fair	1 to 200	19 mils	24 min.	0.0253 mil
60	F	2.9 Kg.	Fair	1 to 250	23 mils	37 min.	0.0319 mil

Average M. L. D. per Kg. = 0.0287 mil.

TINCTURE OF DIGITALIS FROM "D."

Test on Dogs.

133*	M	10.0 Kg.	Fair	1 to 2	22 mils	38 min.	1.1 mils
134	M	9.5 Kg.	Fair	1 to 2	23 mils	48 min.	1.31 mils
138	M	8.9 Kg.	Fair	1 to 2	23 mils	45 min.	1.29 mils
144	M	5.9 Kg.	Fair	1 to 3	25 mils	36 min.	1.41 mils

Average M. L. D. per Kg. = 1.34 mils.

Test on Cats.

62	M	Good	3.2 Kg.	Fair	1 to 5	15 mils	20 min.	0.94 mil
63	M	Good	2.6 Kg.	Light	1 to 6	16 mils	30 min.	1.02 mils

Average M. L. D. per Kg. = 0.98 mil.

OUABAIN FROM "D."

Test on Dogs.

143	F	11.4 Kg.	Light	1 to 15	34 mils	48 min.	0.198 mil
146	M	9.0 Kg.	Fair	1 to 15	25 mils	33 min.	0.185 mil
147	F	7.7 Kg.	Fair	1 to 15	22 mils	27 min.	0.190 mil

Average M. L. D. per Kg. = 0.191 mg.

Test on Cats.

71*	F	Kitten	1.2 Kg.	Fair	1 to 50000	15 mils	40 min.	0.250 mg.
72	M	Good	2.94 Kg.	Good	1 to 40000	25 mils	45 min.	0.213 mg.
73	F	Good	2.5 Kg.	Fair	1 to 40000	19 mils	34 min.	0.190 mil

Average M. L. D. per Kg. = 2.20 mg.

TABLE VI.—RESULTS OF TEST UNKNOWNS.

Sample.	% of Original. Dogs.	Cats.	Frogs.	Correct percent.
Tr. Stroph	74.5%	62.6%	66.7%	66.7%
Tr. Digitalis	135%	159%	160%	150%
Ouabain	79%	63%	64%	60%

From the results of the test of the unknowns reported in Table VI, it can be seen that the frog assay is the more reliable since in one case the report was exactly right, and in the other two, slightly high (a matter of about 7 percent). Two of the results on the dogs were considerably high while the third was about as much too low, showing no consistency toward either high or low results. The results on the cats were much better than those on the dogs but not quite as good as those obtained by the frog method. Because of the fact that we have used the M. L. D. frog method for so many years to check up dilutions (based on original assays) of commercial lots and have with *very* few exceptions found it to be accurate, it seems that the results obtained from this small series of unknowns is entirely representative of the relative merits of the method.

Enough data was not obtained with cats to absolutely prove that they are as unsatisfactory as dogs and in fact I scarcely believe that they are but the data reported in Table IV indicates that there is no real consistency between the results obtained when using the cat and those obtained with the frog. Since the frog method vindicated itself so satisfactorily in the test of the unknowns it seems hardly possible that the cat method can be considered to possess the same degree of accuracy.

It, therefore, seems most logical to conclude from the results reported that no relationship exists between the M. L. D.'s of heart tonic preparations to cats, dogs and frogs and that consequently, since the frog method has shown itself to be the most accurate by tests of samples of unknown activity, the M. L. D. frog method is the most accurate of the three. This being true, there should certainly be no hesitancy as to the choice of the method for use in quantitative assay work even though it might possibly be proved that the cat or dog method is a little the less expensive and that results can be obtained in a somewhat shorter time than with the frog method.

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STANDARDIZATION OF DIGITALIS—A PRELIMINARY REPORT.*

BY ROBERT A. HATCHER, M.D.

Some of those present will remember that Apocynum and Euonymus were dismissed from the Pharmacopoeia because it was held that no safe and effective dose could be given. Oral doses of these drugs equal to many times the fatal vein dose may be administered to animals without inducing any effects in many cases. Convallaria behaves similarly. The absorption of strophanthus and strophanthin is also imperfect; if the single daily of strophanthus—0.06 Gm. every four hours—were absorbed promptly it would prove almost immediately fatal, in fact, one could not administer it every four hours for an entire day, as that would be equal to about twice the average fatal vein dose for a man if his susceptibility is equal to that of the cat.

The daily proof of the poor absorbability of strophanthus is had in the fact that the dose given in the Pharmacopoeia for it is the same as that for digitalis, though the Pharmacopoeia requires that strophanthus shall be just one hundred times as active as digitalis. In other words, if one gives an effective dose of strophanthus he must give far more than the patient could possibly withstand should absorption occur.

Experience has taught us the danger of administering strophanthus by the mouth, and certain clinicians no longer use strophanthus orally. I am firmly convinced that many patients have died from the immediate effects of strophanthus, death being attributed to cardiac disease.

So, there is a firm basis for the continued belief in the superiority of digitalis among the more careful clinical observers, since it shows the *most nearly* uniform absorption and clinical effects of any of the drugs of the group. It is not my purpose to undermine the confidence in an old friend, but rather is it my purpose to show that Digitalis is a sort of Jekyll and Hyde, inasmuch as its constituents are not all of the readily absorbable type.

During the course of an investigation undertaken at this time for another purpose I hit upon an extremely simple and easy method of separating the digitalis principles into two groups. One of these may be termed, for convenience, the Chloroform-soluble group, and the other the Water-soluble group. The best method of separating them has not been worked out in all its details, and it presents a number of minor problems, but it may be described as follows: The digitalis in powder is exhausted with water on a water bath, the infusion is filtered, the filtrate concentrated to a syrupy consistence and precipitated with a large excess of alcohol, the alcohol is expelled, the residue taken up in water and the solution shaken several times with chloroform. The chloroformic solution is distilled and the residue taken up in diluted alcohol.

I have received a number of specimens of digitalis tincture from clinicians in well known hospitals, with the request that I test them because they failed to induce the usual effects of digitalis. In every case I found the tinctures fairly active.

The most striking case of this sort will be described briefly. Dr. Wedd, working in the service of Dr. Carter, in the Cleveland City Hospital, sent a speci-

*Read before Scientific Section, A. Ph. A., New York meeting, 1919.

men of tincture of digitalis for examination because of the failure to secure any toxic effect with total amounts of as much as 149 Cc. administered to a patient, weighing 140 pounds, during a single course of treatment. This amount merely caused slowing. I found the tincture to be active by the biologic test.

The chloroform-soluble fraction varies in the percentage of the total active constituent, but the specimen just described showed an unusually low percentage, this fraction constituting only one-fourth of the total activity of the leaf. At the other extreme in the series thus far tested, is a specimen placed in alcohol by Professor Newcomb immediately after gathering a leaf of the first year. In this the chloroform-soluble constituent constituted about 65 percent of the active constituents.

It is my purpose to examine specimens of the leaf obtained from various sources, and variously treated, both from the first and second year, in order to determine whether one can be found of constant composition, or that which yields constantly the highest percentage content of the more absorbable constituent.

I have been fortunate in securing the coöperation of growers and dealers and hope to be able to report much progress during the coming year.

One specimen of fluidextract at least 38 years old was fractioned, and while the amount available was too small for satisfactory study (especially as it involved a probable accident) it seems that the content of the chloroform-soluble constituent in this specimen is very high.

The work raises numerous problems which cannot be discussed now, but it seems clear that the higher the digitoxin content (if digitoxin is present in the leaf) the lower should be the biologic activity measured by the official assay, but the more active by oral administration. It seems probable from previous work done in our laboratory that the water-soluble constituent is relatively more actively emetic than the chloroform-soluble. Not only is the chloroform-soluble fraction absorbed more readily than the water-soluble, but it is almost certainly more lasting in its effects, in other words, its action probably persists for as many weeks as that of the other in days.

I believe that we must assay digitalis with reference to the content of this more readily absorbable fraction, and that a specimen containing a high percentage of this fraction will be more active clinically than one showing a greater total activity but with a low percentage of this fraction.

Incidentally, I believe that this chloroform-soluble fraction may be made available for intravenous use, since it mixes perfectly with water. The permanence of such mixtures has not been sufficiently studied.

DETERIORATION OF HIGH TEST AMERICAN-GROWN DIGITALIS.*

BY J. F. O'BRIEN AND J. P. SNYDER.

In the Fall of 1916 we received a shipment of American-grown Digitalis from the state of Washington, which upon assay gave such a high test by the U. S. P.

*Read before Scientific Section, A. Ph. A., New York meeting, 1919.

IX method that we decided to prepare a tincture and a fluidextract and determine the deterioration after standing for a considerable length of time. Accordingly we prepared, following out the methods as outlined in the Pharmacopoeia, a tincture and a fluidextract, and after making tests by the U. S. P. frog method, the 24-hour guinea pig method and the Hatcher & Brody cat method these two preparations were allowed to stand in the laboratory under conditions which closely paralleled that in which tinctures and fluidextracts of Digitalis are kept in the average drug store. After a period of two and one-half years the tincture and the fluid were tested under similar conditions by the same methods as when first prepared.

TINCTURE OF DIGITALIS BY GUINEA PIG METHOD.

Animal.	No.	Wt.	Dose per 250 Gm.	Dilution.	Dose of dilution.	Results after 24 hours.
Guinea pig	1	255	0.4	1–1	0.4	Died
Guinea pig	2	315	0.6	1–1	0.75	Died
Guinea pig	3	280	0.8	1–1	0.9	Died
Guinea pig	4	310	1.0	1–1	1.24	Died
Guinea pig	5	255	1.1	1–1	1.12	Died
Guinea pig	6	215	1.2	1–1	1.03	Died
Guinea pig	2	315	0.4	1–1	0.5	Died
Guinea pig	4	305	0.3	1–1	0.36	Died
Guinea pig	5	370	0.2	1–1	0.3	Recovered
Guinea pig	6	290	0.4	1–1	0.46	Died
Guinea pig	7	320	0.3	1–1	0.38	Died
Guinea pig	1	250	0.2	1–1	0.2	Recovered
Guinea pig	2	360	0.1	1–1	0.14	Recovered

Accepting the standard for a 250 Gm. guinea pig as 1 Cc., we find this Tincture Digitalis to test 330 percent, we finding the M. L. D. for a 250 Gm. pig to be 0.3 Cc.

TINCTURE DIGITALIS BY GUINEA PIG METHOD AFTER STANDING TWO AND ONE-HALF YEARS.

Animal.	No.	Wt.	Dose per 250 Gm.	Dilution.	Dose of dilution.	Result.
Guinea pig	1	600	0.4 mil	1–1	0.96	Died
Guinea pig	2	540	0.5 mil	1–1	1.08	Recovered
Guinea pig	3	415	0.6 mil	1–1	0.99	Died
Guinea pig	4	480	0.7 mil	1–1	1.34	Died
Guinea pig	5	585	0.8 mil	1–1	1.87	Died
Guinea pig	6	575	0.9 mil	1–1	2.07	Died
Guinea pig	7	660	0.3 mil	1–1	0.79	Recovered
Guinea pig	8	405	0.4 mil	1–1	0.65	Recovered
Guinea pig	9	480	0.4 mil	1–1	0.77	Recovered
Guinea pig	10	435	0.43 mil	1–1	0.75	Died
Guinea pig	11	455	0.45 mil	1–1	0.82	Recovered
Guinea pig	12	380	0.47 mil	1–1	0.71	Recovered
Guinea pig	13	495	0.5 mil	1–1	1.0	Recovered
Guinea pig	14	595	0.55 mil	1–1	1.3	Recovered
Guinea pig	15	360	0.57 mil	1–1	0.82	Died
Guinea pig	16	480	0.55 mil	1–1	1.05	Recovered
Guinea pig	17	455	0.57 mil	1–1	1.03	Died

M. L. D. is 0.57 per 250 Gm. Pig percent of activity, 175.

TINCTURE DIGITALIS BY ONE-HOUR FROG METHOD.

No.	Dose per Gm.	Weight.	Dose.	No. Cc.	Result after one hour.	Dilution
127	0.006	28.9	0.1734	0.17	Stopped	20–100
128	0.005	31.9	0.15	0.16	Stopped	20–100
129	0.004	24.9	0.099	0.19	Stopped	20–100
130	0.003	27.9	0.083	0.08 = 0.4	Stopped	20–100
131	0.002	24.8	0.049	0.05 = 0.25	Recovered	20–100
132	0.003	26.2	0.078	0.08 = 0.4	Stopped	20–100
127	0.001	27.7	0.0277	0.0277 = 0.13	Beats	20–100
128	0.002	23.0	0.046	0.046 = 0.23	Stopped	20–100
129	0.003	27.0	0.081	0.081 = 0.40	Stopped	20–100

From the above we selected the M. L. D. as 0.0025 with ouabain at 0.000,00055, which in terms of percentage would be 264.

TINCTURE DIGITALIS BY ONE-HOUR FROG METHOD AFTER STANDING TWO AND ONE-HALF YEARS.

After standing we find that the tincture digitalis tests by the one-hour frog method 120%, we selected the M. L. D. as 0.006 with ouabain at 0.000,0006, which shows preparation to test 120%.

No.	Wt.	Dose per Gm.	Dose.	Dilution.	Dose of dilution.	Result.
1	20.2	0.003	0.06	1–1	0.06	B
2	18.0	0.004	0.07	1–1	0.07	B
3	17.3	0.005	0.085	1–1	0.085	B
4	12.5	0.006	0.075	1–1	0.075	S
5	15.2	0.007	0.1	1–1	0.1	S
2	18.4	0.008	0.15	1–1	0.15	S
1	18	0.0055	0.1	1–1	0.1	B
2	17.6	0.0057	0.1	1–1	0.1	B
3	15	0.006	0.09	1–1	0.09	S
4	18.4	0.0057	0.1	1–1	0.1	B
5	20	0.006	0.12	1–1	0.12	S

M. L. D.—0.006 with ouabain at 0.000,0006. Percent of activity, 120.

TINCTURE DIGITALIS BY CAT METHOD.

Weight of cat.	Sex.	Mils of digitalis injected.	Mils of ouabain injected.	Dilution.	1 mil ouabain.	Results.
2 kilos	female	4	5	1–10	0.00002	40 mg. = C.U.

Here we find that 50 mg. of digitalis is equal to one cat unit, as Hatcher and Brody consider the cat unit for digitalis to be about 100 mg. We find this in terms of percentage to be about 250.

TINCTURE DIGITALIS BY CAT METHOD AFTER STANDING TWO AND ONE-HALF YEARS.

Weight of cat.	Sex.	Mils of digitalis injected.	Mils of ouabain injected.	Dilution.	1 mil ouabain.	Results.
2.7 kilos	female	4	10	1–10	0.0002	57.7 mg. = C.U.

Here we find that 1 C. U. = 57.7 mg. or 173%. The check analysis gave 174%.

F. E. DIGITALIS BY THE GUINEA PIG METHOD.

Animal.	No.	Wt.	Dose per 250 Gm.	Dilution.	Dose of dilution.	Result after 24 hours.
Guinea pig	1	250	0.01	1–20	0.2	Recovered
Guinea pig	2	255	0.02	1–20	0.4	Recovered
Guinea pig	3	275	0.03	1–20	0.66	Recovered
Guinea pig	4	300	0.04	1–20	0.96	Died

Animal.	No.	Wt.	Dose per 250 Gm.	Dilution.	Dose of dilution.	Results after 24 hours.
Guinea pig	1	320	0.02	1–20	0.51	Recovered
Guinea pig	2	2 0	0.03	1–20	0.67	Died
Guinea pig	3	260	0.03	1–20	0.62	Died
Guinea pig	4	245	0.04	1–20	0.78	Died
Guinea pig	5	250	0.03	1–20	0.6	Died
Guinea pig	6	265	0.04	1–20	0.84	Died
Guinea pig	1	245	0.02	1–20	0.4	Recovered

We selected from the above 0.03 Cc. as the M. L. D. for a 250 Gm. guinea pig, which, in terms of percentage, would be 330.

F. E. DIGITALIS BY GUINEA PIG METHOD AFTER STANDING TWO AND ONE-HALF YEARS.

Animal.	No.	Weight.	Dose per 250 Gms.	Dose.	Dilution.	Dose of dilution.	Result.
Guinea pig	1	545	0.04	0.087	1–10	0.87	Recovered
Guinea pig	2	475	0.05	0.095	1–10	0.95	Recovered
Guinea pig	3	640	0.055	0.14	1–10	1.4	Recovered
Guinea pig	4	520	0.06	0.12	1–10	1.2	Died
Guinea pig	5	515	0.055	0.11	1–10	1.1	Recovered
Guinea pig	6	410	0.057	0.093	1–10	0.93	Died
Guinea pig	7	435	0.06	0.104	1–10	1.04	Died
Guinea pig	8	425	0.055	0.093	1–10	0.93	Recovered
Guinea pig	9	465	0.057	0.106	1–10	1.06	Died

M. L. D. 0.057. Percent of activity, 175%.

F. E. DIGITALIS BY ONE-HOUR FROG METHOD.

No.	Dose per Gm.	Weight.	Dose.	No. Cc.	Results after one hour.	Dilution.
127	0.0006	26.4	0.0158	0.016 = 0.8	Stopped	20–1000
128	0.0005	23.1	0.01155	0.011 = 0.55	Stopped	20–1000
129	0.0004	24.8	0.0099	0.0099 = 0.49	Stopped	20–1000
130	0.0003	29.9	0.0089	0.0089 = 0.49	Stopped	20–1000
131	0.0002	23.8	0.0047	0.0047 = 0.23	Beats	20–1000
132	0.0001	30.6	0.00306	0.00306 = 0.15	Beats	20–1000
127	0.0002	31.9	0.00638	0.00638 = 0.32	Stopped	20–1000
128	0.00025	27.8	0.00695	0.00695 = 0.34	Stopped	20–1000
129	0.0003	26.9	0.00807	0.00807 = 0.4	Stopped	20–1000
129	0.0003	25.0	0.0075	0.0075 = 0.37	Stopped	20–1000

Here we figure the M. L. D. to be 0.00025, which gives us in terms of percentage 264 percent, with ouabain at 0.000,00055.

F. E. DIGITALIS BY ONE-HOUR FROG METHOD AFTER STANDING TWO AND ONE-HALF YEARS.

No.	Weight.	Dose per Gm.	Dose.	Dilution.	Dose of dilution.	Result.
1	18.1	0.0003	0.0054	1–10	0.054	B
2	19.0	0.0004	0.0072	1–10	0.07	B
3	15.8	0.0005	0.008	1–10	0.08	B
4	17.1	0.0006	0.01	1–10	0.1	S
5	18.0	0.00057	0.01	1–10	0.1	B
6	16.0	0.0006	0.009	1–10	0.09	S
7	15.4	0.0057	0.0087	1–10	0.09	B
8	10.2	0.0006	0.011	1–10	0.11	S

M. L. D. 0.0006 with ouabain at 0.000,0006 or 120%.

F. E. DIGITALIS BY CAT METHOD.

Weight of cat.	Sex.	Mils of digitalis injected.	Mils of ouabain injected.	Dilution.	1 mil ouabain.	Results.
2.6 Kilos	female	4	8.5	1–100	0.00002	44.4 mg. = C. U.
2.7 Kilos	male	4	8.2	1–100	0.00002	33.7 mg. = C. U.

The average of 44.4 and 37.7, the number of mgs. of digitalis form the fluidextract which we find by this method to be equal to a cat unit, is 41; and, based upon 100 mg. as the standard cat unit, we find the percentage strength of this to be about 244 percent.

F. E. DIGITALIS BY CAT METHOD AFTER STANDING TWO AND ONE-HALF YEARS.

Weight of cat.	Sex.	Mils of digitalis injected.	Mils of ouabain injected.	Dilution.	1 mil ouabain.	Results.
2 kilos	male	4	7.5	1–100	0.00002	57.6 mg. = C. U.

Test is 173%. Check 175%.

DETERMINATION OF LETHAL DOSE OF OUABAIN ON CATS.

Female Cat

Weight 2.5 kilos

Time	4.05	4.10	4.15	4.20	4.30	4.40	4.50	5.00	5.10	5.20	5.30	5.40	5.45	5.50	6.00	6.10
No. of Cc..	1	1	1	1	1	1	1	1	1	1	1	0.5	0.5	0.2	0.3	dead

Male Cat

Weight 2 kilos

Time	10.00	10.10	10.20	10.30	10.40	10.50	11.00	11.10	11.20	11.30	11.40	11.50	12.00	12.15	12.30
No. of Cc..	1	1	1	1	1	1	1	1	1	0.5	0.5	0.5	0.3	0.2	dead

From the above we find that in cat No. 1 the cat unit is 0.1 mg. per kilo, and in cat No. 2, 011 per kilo, and that these both closely check the standard selected by Hatcher and Brody which is 0.1 mg. per kilo weight of cat.

CONCLUSION.

We find from the results of the above experiments that tincture and fluidextract of digitalis prepared from this particular lot of drug does deteriorate and that the deterioration in the tincture and fluidextract is practically the same. In the case of the guinea pig method, we first find it to test 330 percent, and after standing, 175 percent, or a loss in activity by the guinea pig method of 47 percent. In the case of the tincture and fluidextract by the one-hour frog method we formerly found it to test 264 percent and after standing, 120 percent, or a loss in activity of 55 percent. In the case of the cat method we at first found it to test approximately 250 percent and after standing, 175 percent, or a loss in activity of 30 percent. We therefore find that the frog method shows the greatest deterioration and that the cat method shows the least, and that the guinea pig method more closely checks with the frog method than it does with the cat method as far as deterioration is concerned, although in the case of the guinea pig method no attempt was made to standardize these animals against seasonable variation, which has been shown to exist. Furthermore, that in the case of this high-test digitalis, after being made into a tincture and fluidextract and standing two and one-half years neither the frog method, guinea pig method, nor the cat method shows the preparations to have deteriorated below the U. S. P. minimum standard for the tincture and fluidextract, and the test would indicate that this fluidextract

and tincture after standing this length of time still retains sufficient activity for them both to be considered standard preparations.

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ABSTRACT OF DISCUSSION ON DIGITALIS PAPERS BEFORE SCIENTIFIC SECTION, A. PH. A.

ROBERT A. HATCHER: I have a number of questions. I hope I won't seem too inquisitive. I have been very much put to it to secure my favorite animal, the cat, in testing, and I have been casting about to see if I could substitute frogs for cats. That might come as a shock to a good many members of this assembly, but it has been impossible at times to secure an adequate supply of cats. I have been experimenting on frogs, and while I had from time to time standardized various preparations on frogs, I recently purchased a batch of five hundred frogs with which I was utterly unable to standardize a single preparation of digitalis and could not even standardize the frogs against ouabain. On three hundred and seventeen out of five hundred frogs I could not standardize the frogs against ouabain. Now there are some here who will throw up their hands in horror at my inability to do this. I have, however, consulted with others, who informed me that the uniformity of absorption is the bane of the work in the hygienic laboratory; that they occasionally have similar experiences. Now if gold fish eliminate the uncertainty due to variation in susceptibility I am certainly glad because of the saving in time consumed. I want to ask if the same ratio exists between the toxicity of tincture of strophanthus and tincture of digitalis when tested on gold fish or when tested on cats or frogs?

PAUL S. PITTENGER: I had better answer the questions as they come up. We have not gone far enough with the gold fish method to find the exact ratio between digitalis and the other drugs. We intend to take up strophanthus and the other drugs later on. We have, however, started with ouabain and found that it took a very much greater amount of ouabain in comparison with the amount of digitalis required to produce toxic effects than on either frogs or guinea pigs.

ROBERT A. HATCHER: More ouabain?

PAUL S. PITTENGER: No, not more ouabain than tincture of digitalis, but many times more ouabain *in comparison with the amount of digitalis* than by either the guinea pig or frog method.

ROBERT A. HATCHER: Where it is not necessary to be absolutely accurate what are the ranges of accuracy with slight variations in temperature? It is rather difficult to maintain a temperature that does not vary over a degree.

PAUL S. PITTENGER: All these tests were carried out with a variation in the temperature bath from one to one and a half degrees, with the accuracy of the test well within two and a half percent.

HENRY KRAEMER: I was very much interested in the paper of Dr. Pittenger because I have long realized that gold fish were exceedingly sensitive to chemical substances. A few years ago a client came to me to investigate a problem. He had some trees which had been destroyed by a Public Service Corporation tearing up the streets, affecting the gas mains. So I was called in about eighteen months after the damage had been done, to act in the capacity of an expert. I went out and saw the trees were all dead. The question was, what had killed them? It occurred to me that there ought to be some definite, scientific way of showing the cause. The soil was clay, so I had a man dig down about six feet and obtained some samples. It occurred to me that probably a very simple test could be performed by comparing my samples with ordinary soil from some other locality. I bought a couple dozen gold fish and it was surprising as to how immediate the reaction was. After putting a sample of the soil, which I had obtained from the roots which were injured, in the water the gold fish immediately succumbed. One thing you have to watch in the city, where you have flowing water, is the effect of the chemicals used in treating the water. One time, for instance, I was making starch water, and was surprised to see how much the water tested of chlorine. Such things are very apt to affect some work, when you are expecting definite reactions you may have those from the chemically treated water. I merely interject this so you will appreciate that there are some things apart from the

sensitiveness of the gold fish that will have to be taken into consideration. There is no question but that gold fish are wonderfully sensitive to a poisonous substance like chlorine gas.

HERBERT C. HAMILTON: I have been very much interested in the subject of the use of gold fish for standardizing digitalis. I recall very well the presentation of Dr. Pittenger's first paper quite a number of years ago. About twelve years ago our firm was submitted a sample of some kind of root that was used as a fish poison in the East Indies or somewhere in a foreign country. It was put up to us to see whether it contained anything of therapeutic value. It seemed to be not particularly poisonous. I tried the drug on gold fish. As Dr. Pittenger and Dr. Kraemer have mentioned, I found the gold fish exceedingly sensitive to the material. While the possibility of using them for standardizing drugs never occurred to me, it certainly was a wonderful means of demonstrating the value of that fish poison. There is one question that I do not know whether Dr. Pittenger brought out, as I did not hear all his remarks. I would like to bring out the point as to whether the test could be shortened up in time, and instead of three hours have the time nearer two hours without seriously impairing its accuracy. Another point I want to speak of. Objection might be raised on the point as to whether the toxicity test is a clear indication of the therapeutic value of these heart tonics. One of the things we always think of in connection with the use of frogs, in testing, is the opportunity of examining the heart to see if it is contracted, which is very characteristic of digitalis and is a means of eliminating the frogs that die from other causes. It seems to me that this is one and may be almost the only point that can be raised against this method of testing.

PAUL S. PITTENGER: In regard to the time, I would state that the paper shows very conclusively that the results obtained with a time limit of exactly three hours are more accurate than those obtained by a shorter or longer limit. We ran experiments using doses large enough to kill in from one-half hour to two or three hours; from three to six hours; from six to eight hours; and from twelve to twenty-four hours; in other words, to see which time limit gave the most sensitive results. We found the method most sensitive by using a limit of three hours. That is the reason we adopted three hours for the time limit. Using the method described with a three hour "time limit" we were able to get accurate results down to a variation of only five hundredths of a mil of tincture of digitalis in 500 mils of water. Of course it is almost foolish to try such small quantities, but we actually did get fairly concordant results with a variation in the dosage as small as this. Although some fish died "out of order" the M. L. D. could be accurately determined. In regard to the toxicity, I have not carried out any experiments to prove whether the results obtained on fish parallel those obtained on frogs. This can very easily be determined, however, by testing a series of drugs by both methods.

Discussion on papers by L. W. Rowe and Robert A. Hatcher.

JACOB DINER: Both Dr. Rowe and Dr. Hatcher are to be complimented. I was very glad to hear Dr. Rowe bring out the inconsistency between the action upon the cat, the dog, and the frog. It merely brings home to us again the fact that the pharmacologists have been getting into a rut and the sooner they get out of that rut the better it will be for humanity. Animal experimentation has its proper place, but in my opinion animal standardization as it is being carried out today is not right. We are not interested in killing the cat or dog or frog or the gold fish. We are interested in obtaining certain therapeutic effects upon a pathologic heart, being either functional or organic. I believe that the clinicians are coming more and more to rely upon advertised articles merely because there is a claim for them of certain therapeutic value. Dr. Hatcher is to be congratulated for his very ingenious and praiseworthy efforts in regard to the action of digitalis, showing that the chloroform-soluble and the water-soluble portions are entirely distinct groups in their action, and if they are distinct in their action on the animal it is fairly reasonable to assume that they may be much more distinct in their action on the human being. I was delighted to hear that Dr. Hatcher will insist upon clinical observations. After all that is the only test. It is true that we cannot use men for standardization, but we certainly can use them for clinical observation. Upon that and that alone should we base our final answer. It is too bad that we cannot find the certain dose, but from personal observation I might state that I still use digitalis by the mouth and I frequently obtain very satisfactory results.

HERBERT C. HAMILTON: Speaking on the line that Dr. Diner has just discussed, I think there is a misconception possibly among pharmacologists, a misconception as to what standardiza-

tion and testing means. A pharmacist takes a solution containing an alkaloid and he titrates or shakes it out with chloroform or ether or something like that and his test has absolutely no relation to the therapeutic value of the drug. I have always contended that a biological test is the standardization test comparable to a chemical test, chemical or pharmaceutical, and that there is no necessity of there being any relationship between a standard test dose and the therapeutic dose. A therapeutic dose is something that must be determined by clinicians; a standardization dose may be entirely different and may bring about an entirely different set of reactions. I think, of course, if there could be a determined relationship between the two, it would be very nice, but when any one asks what is the relationship between a standard test dose for a cat, a dog, a guinea pig, a gold fish, or a human being, I think everybody would admit that it is rather absurd that there could be any relationship between them. I always have contended that the cat method was merely another of the toxicity tests with no definite point to indicate whether the death of the animal was due to digitalis. Of course, with careful work there would be no reason for suspecting anything to be present in digitalis or strophanthus that did not have direct action on the heart. Still there is always the possibility of decomposition products being present and producing the death of the animal instead of the principle of therapeutic value. The frog method always gives one the opportunity of examining the heart to see, by the position of the heart, whether the death of the frog was due to digitalis or not.

OTTO RAUBENHEIMER: This is evidently the age of learning, and Dr. Hatcher is going to revolutionize not only the therapeutics but also the chemistry of digitalis. Up to now the theories have always been that the higher the alcoholic content of the menstruum, the better the glucosidal preparations keep. This is the reason we are using ninety-five percent of alcohol for strophanthus. This is the reason we are using seventy percent alcohol for tincture of digitalis. Now Dr. Hatcher comes along and says—I hope he is right; he is always right—he says that water extracts it all. What cheaper solvent can you get than water? Why, pharmacists will all be happy making tincture of digitalis with water, and extracting all the virtues of digitalis. Dr. Hatcher is to be complimented on his experiments. He has kept on for ten years, as long as I have known him. I believe he will after all reach that conclusion which has been well established for years and years, that *wild grown* digitalis is the most active drug.

HENRY KRAEMER: Fortunately there are so many observers at the present time, and we see this subject from our experience in a good many different ways, I want to just interject a thought to Dr. Raubenheimer, that in my experience the wild grown digitalis is not by any means equal to that which is cultivated. I had an experience last summer in growing—I forget how much we did grow but it was considerable—several hundred pounds of digitalis. In fact, my plants grew so fast that I was at a loss to know whether I could bring them in or let them go to waste. All that I could do was to bring the digitalis in and let it dry as best it could, taking the *whole* plant and stringing it on wires, and so on. That digitalis is three times the strength of any digitalis on the market, as far as known.

I want to bring to your attention one thought in connection with chloroform extract. I have been working for fifteen or twenty years with these things, with chlorophyl, etc. Here is my point for you to think about. This chloroformic extract will look different if its alcoholic solution is reduced at some point with zinc. Furthermore, if that reduction product is kept from the air by inverting the bottle you will be surprised what a change it will make. Doctor, that is a very important contribution, because we will never formulate a preparation of digitalis until we know more about these constituents.

OTTO RAUBENHEIMER: I still maintain that the digitalis that Dr. Kraemer spoke about was wild, because he said he neglected its cultivation. It must have been wild.

HENRY KRAEMER: I did not neglect the cultivation. I did not pay any attention to all those modern methods that are sometimes assumed to be necessary in the harvesting of digitalis. I did not mean to infer that my own method of the preparation of digitalis was not probably more scientific than the other.

PAUL S. PITTENGER: First of all I wish to state that my observations agree with Dr. Kraemer's, namely, that cultivated digitalis as a whole is very much more active than the wild or uncultivated drug. At our Glenolden farms we have been able, through cultivation, to produce for the past several years hundreds of pounds of digitalis, containing two, three and even four times our standard activity. Next, I would like to ask Dr. Hatcher if he made any tests to

determine what proportion of the entire activity of the drug was contained in each of his two extracts and whether the activity of the one extract added to the activity of the other would equal that of an extract of the whole drug?

ROBERT A. HATCHER: Whether the separate constituents represented the entire drug?

PAUL S. PITTENGER: Yes, whether there were any comparisons made between the activity of your extracts and a tincture made from the same drug.

ROBERT A. HATCHER: In one effort to get rid of the chlorophyll I lost ninety percent of it in refining it. I did not always get the total, but it comes out this way. For this experiment I used six hundred and ten grammes of powder to make the infusion. The total mixture of all of these came out seventy-nine hundred cat units for the total six hundred and ten grammes. A total of the separate substances, I think, came out something like seventy-one hundred. I only made a few tests. The separate infusions came out seventy-nine hundred. I believe this came out one-tenth short, but that was a loss I was not particular about because in these precipitates I did not make any effort to get out the last trace.

PAUL S. PITTENGER: In reference to the cat method for general standardization purposes, I find that fairly accurate results can be obtained with this method, but our principal trouble is the same as with the other workers, namely, the difficulty in obtaining enough cats to carry out our assays. In fact, in Philadelphia it is almost impossible to get cats. I can get dogs. I send men away with dogs; not so with cats.

Now as to the time. Granted that a single test by the cat method takes less time to carry out than the frog, guinea pig or gold fish method, I do not think that that is true when you have a number of tests to carry out at the same time. We often have from fifteen to twenty samples at one time. With either the frog, guinea pig or gold fish method you can work on the whole series at one time. You can give all your frog or guinea pig injections in fifteen or twenty minutes, after which, in the case of the guinea pig method, there is nothing to do until the next day, or, with the frog method, for an hour. In this way you can work on fifteen or twenty tests at one time. With the cat method you can only work on one animal at a time, and it therefore takes a great deal more instead of less time. I think Dr. Rowe is to be congratulated on his constant temperature tank for frogs, because that is something the practical laboratory needed for quite a long time.

LYMAN F. KEBLER: I have been interested in this discussion. I confess that there still seems to be so very much that is unsatisfactory in these methods. We, of course, in our work are asked to pass on the quality and character of goods imported into the country and especially from one state to another. We have tried to use some of these physiological and biological tests, as you call them, and then run up against exactly these various propositions, and the result frequently is that the goods have to be released, and, therefore, they come on the market probably not coming up to the strength called for by manufacturer A or manufacturer B. It is very interesting to find that after you do release some of these products or drugs, manufacturer A finds them perfectly satisfactory but manufacturer B does not find them satisfactory at all. He calls them unreliable and we are criticized for letting them in. Here is the other proposition: Suppose that we have these methods and we run up against these snags—these apparently unsatisfactory conditions that our friends record here—what are we to do about it? Are we going to hold up a man's goods until these things are digested? We cannot do that. As a matter of fact, the situation now is that we have to let the goods in under the conditions that obtain. I certainly hope that something will be done to rectify the situation. Probably the criticism sometimes comes that we let in and permit shipment of low-grade adulterated goods. That may be under the conditions by which we are operating. That not only holds for these biological tests but some of the other tests that we run up against. Dr. Kraemer reported some article with fifty percent adulteration. We should take that up and see where we stand.

ROBERT A. HATCHER: May I say that my ambition is to see this done. We are really going the wrong way around about the whole method of the examination of tinctures. We are going at it in a positively silly fashion. At the outbreak of the war I was in communication with the medical branch of the War Department, and had about gotten a promise to have enough crude digitalis leaves assembled in one single lot which was to be mixed thoroughly and then tested, after which all the tincture of digitalis of the United States Army was to be made from that single lot. In this way, no matter where a physician went from camp to camp, wherever

he might be he would have the same tincture to deal with. That was carried out partially. The Government assembled six hundred pounds at Minneapolis and six thousand pints of tincture digitalis was made from that one single lot. But unfortunately it did not supply the whole Army. Previous to this on testing again and again specimens for the Army in different camps, I could find no activity, and they could not get any effect, and that was simply because the digitalis was of inferior grade.

AMBROSE HUNSBERGER: I am in sympathy with Dr. Hatcher's suggestions because the question of digitalis has been one that interested me particularly during the past year. I was also interested in Professor Kraemer's statement regarding the digitalis that he grew, comparing it with the digitalis on the market at the present time. I was wondering whether he compared it with the digitalis that he bought on the market during the past year or whether he found it two or three times as strong as the U. S. P. standard.

OBSERVATIONS ON DIGITALIS SIBIRICA.*

BY HEBER W. YOUNGKEN.

About two years ago, the writer received a number of samples of medicinal plant seeds from the Bureau of Plant Industry of the United States Department of Agriculture. Among these was a generous supply of the seeds of *Digitalis Sibirica* Lindley.

Some of these seeds were sown in a seed pan in the greenhouse of the Philadelphia College of Pharmacy. They were found for the most part viable, for ere long they germinated into a goodly number of seedlings. These seedlings were later transplanted to boxes on the roof garden containing ordinary garden soil. Here they thrived so well, forming, in most instances, a good rosette of leaves at the end of the season, that his attention became more concentrated upon them.

He next conceived the idea of determining how the pharmacodynamic properties of their leaves compared with those of *Digitalis purpurea* Linne. The results of a biologic assay, performed by testing the tincture of the leaves (prepared in accordance with the U. S. P. method prescribed for Tincture of Digitalis) on normal frogs at a temperature of 22° C. by the one-hour frog method, showed the tincture to be three-quarters over the strength required for the U. S. P. Tincture of Digitalis. Moreover, in every case where the dose was toxic, the heart was found to have stopped in systole. The last effect is the same as has been recorded for all the members of the Digitalis series of cardiac tonics.

As yet he has not had the opportunity to study the pharmacotherapy of the leaves, but, judging from the results of the biologic assay, they may later be found at least as efficient as those of *Digitalis purpurea* L.

Upon searching the literature for botanical references, only one of any value could be found. This was a short article by Lindley in "Digitalium Monographia" published in 1821, in which he pictures the plant in colors, mentions a few of its macroscopic characteristics, and states that its habitat is Siberia and Tartary.

The meagre data on this plant up to the present, linked with the facts that it is so easily grown and has strong prospects, on account of its pharmacodynamic properties, of becoming one of our valued cardiac tonics, inspired the writer to make a botanical investigation, the results of which are hereby presented.

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*Read before Scientific Section, A. Ph. A., New York meeting, 1919.

MATERIALS.

The material used in this investigation included seeds and first and second year plants of *Digitalis Sibirica* Lindley. The seeds were procured from Dr. W. W. Stockberger of the Bureau of Plant Industry, United States Department of Agriculture. From these were raised first and second year plants in ordinary garden soil, on the roof garden of the Philadelphia College of Pharmacy. Additional material in the shape of leaves and plants of the second year's growth was furnished by the Bureau of Plant Industry from its Arlington farms. A part of this material was studied in its natural condition, a part pickled in 50% alcohol for additional observation, and the balance made up into tincture. The leaves employed in the biologic assay (*vide supra*) were obtained from plants of the first year's growth. They were air-dried by placing them in weak sunlight for four consecutive days, at the end of which period they were perfectly dry. The leaves were then ground to a No. 60 powder and a tincture prepared from them in accordance with the U. S. P. IX method prescribed for Tincture of Digitalis.

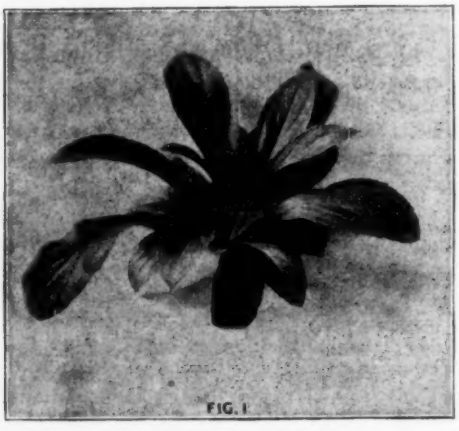


FIG. 1

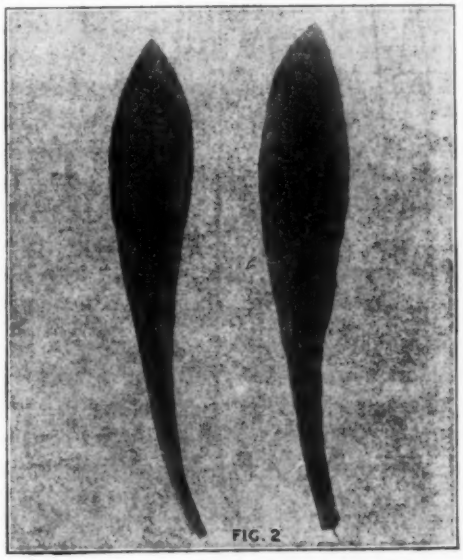
Digitalis Sibirica, Lindley.—Aerial portion of first year's growth.

DESCRIPTION OF PLANT.

Digitalis Sibirica Lindley is a biennial plant indigenous to Siberia and Tartary, but readily adapting itself to cultivation in the latitudes of Washington and Philadelphia. From an underground fibrous root system, there appears, before the close of the first season, a rosette of leaves showing the following macroscopic characteristics: Oblanceolate; 6 to 14 cm. in length, 2 to 5 cm. in breadth; summit mucronate; base somewhat cuneate, tapering into a winged petiole, 2 to 6 cm. long; margin, coarsely serrate in upper portion, becoming distantly serrate in lower; upper surface dark green, becoming on drying olive-green, lower surface paler green, nearly glabrous; venation, pinnate-reticulate, midrib prominent and brown, the brownish veins of the first order slightly elevated and diverging from the midrib at angles of 23° to 33°, anastomosing near the margin; very slightly pilose along veins, particularly in the lower part of lamina and along the margin of the petiole; texture membranous becoming fragile upon drying; taste bitter; odor resembling but fainter than leaves of *D. purpurea*.

During the early autumn of the first year the leaves perish, but the root system lives over the winter. The following spring it becomes more extensive, producing numerous additional branches. During this same season an aërial stem sprouts forth which elongates until by mid summer it may attain a length of 6 dm. This stem bears several branches. Both main stem and branches are green, sparsely hairy and quadrangular with prominent ridges between the angles. These bear foliage leaves below and green bracts and flowers above. The foliage leaves have

the following characteristics: Oblanceolate and winged petiolate and more or less crowded below, resembling the leaves of the first year's growth, oblong-ovate to ovate lanceolate above, becoming gradually shorter toward the summit of the inflorescence; alternate; 6 to 17.5 cm. in length, 2 to 4 cm. in breadth; exstipulate; apex acute or mucronate; base somewhat cuneate; margin, serrate above, becoming distantly serrate, sometimes denticulate, and usually entire toward the base; upper surface dark green, both surfaces only slightly pilose; venation pinnate-reticulate, midrib prominent and brown, the veins of the first order diverging at angles of 23° to 40°, anastomosing near the margin; texture membranous to subcoriaceous; taste bitter; odor resembling but fainter than the leaves of *Digitalis purpurea*.



Digitalis Sibirica, Lindley—Two leaves from first year's rosette, ventral aspect (*a*), dorsal aspect (*b*).

The inflorescence is an elongated raceme which bears numerous bracts and yellow, tubular, drooping, slightly irregular flowers. The bracts are foliage-like below but gradually diminish in size as the inflorescence axis is ascended, until near the summit they become only 4 mm. long and 1 mm. broad. The hermaphrodite flowers are borne singly on the ends of villose pedicels. The calyx is composed of 5 slightly gamosepalous sepals which are subulate and villose. The corolla consists of a yellow inflated, gamopetalous, hirsute tube with a projecting lower lip. The upper lip and portion of inner surface are marked with purplish red spots. The androecium consists of four didynamous stamens with good anthers. The gynoecium is bicarpellate and consists of a two loculed ovary with central placenta, bearing numerous small ovules, an elongated terminal style and a bilobed stigma. The fruit is a two-celled woody capsule 10 to 13 mm. in length, with calyx adherent. The seeds are small, numerous, brown in color, and richly albuminous.

The second season's growth of the plants under cultivation in Philadelphia died to the ground about the middle of July. From the root system there then sprang forth a rosette of long, light green lanceolate leaves. Whether another floral stem also arises, the writer has not yet been able to determine. No evidence of the same has appeared up to August 9th.

HISTOLOGY OF THE LEAF.

Dorsoventral and surface sections of the leaf show the following microscopic peculiarities:

The upper epidermis is composed of a layer of cells which vary in outline from rounded to ovate to somewhat elongated, as observed in dorso-ventral sections. The outer walls of these cells are more or less convex and covered by a thickened

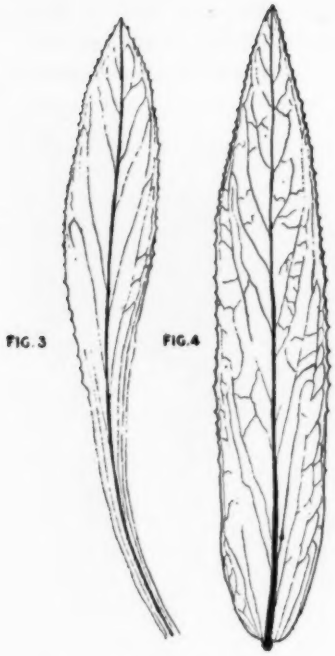


FIG. 3

FIG. 4

FIG. 9

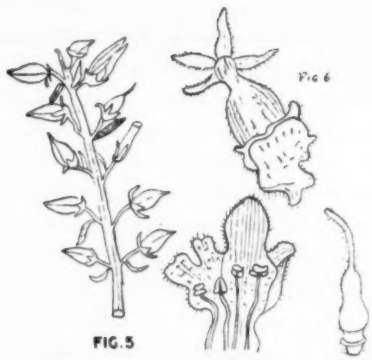


FIG. 5

FIG. 6

FIG. 7

FIG. 8

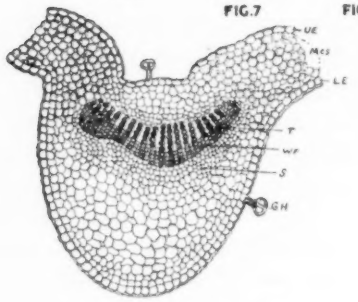


FIG. 10

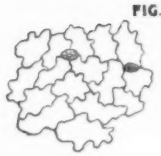


FIG. 11

FIG. 12

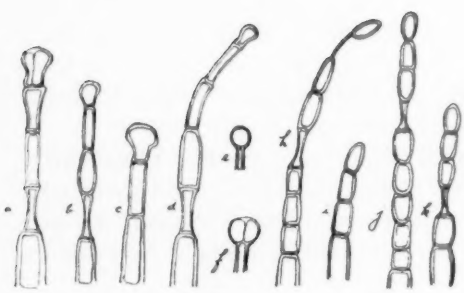


FIG. 13

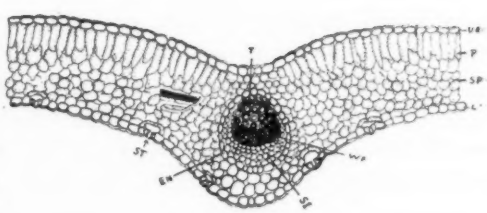


FIG. 14

Fig. 3.—Leaf from basal portion of stem of second year's growth of *Digitalis Sibirica*. Note the winged petiole. Fig. 4.—Leaf from portion of stem higher up of *Digitalis Sibirica*. Fig. 5.—Terminal portion of inflorescence of *Digitalis Sibirica*. Fig. 6.—Flower of *Digitalis Sibirica*. Fig. 7.—Corolla tube dissected, showing stamens within. Fig. 8.—Pistil of *Digitalis Sibirica*. Fig. 9.—Fruit of *Digitalis Sibirica* in process of dehiscing (*a*); valves of same separated exposing septum, placenta and seeds (*b*). Fig. 10.—Transverse section through midrib region of leaf of *Digitalis Sibirica* showing upper epidermis (UE), lower epidermis (LE), mesophyll (MES), tracheae (T), wood fibers (WF), leptome (S) and glandular hair (GH) (highly magnified). Fig. 11.—Surface view of portion of upper epidermis of leaf of *Digitalis Sibirica* (highly magnified). Fig. 12.—Surface view of portion of lower epidermis of leaf of *Digitalis Sibirica* (highly magnified). Fig. 13.—Several types of glandular hairs found on leaves of *Digitalis Sibirica* (*a, b, c, d, e, f*); various forms of non-glandular hairs found on same (*h, i, j, k*) (highly magnified). Fig. 14.—Transverse section of portion of lamina outside of midrib of leaf of *Digitalis Sibirica*, showing upper epidermis (UE), palisade parenchyma (P), spongy parenchyma (SP), lower epidermis (LE), stoma (ST), trachea (T), wood fibers (WF), sieve tissue (SI), and endodermis, surrounding fibrovascular tissue of vein (EN) (highly magnified).

cuticle which appears to be crenulated along the outer margin. The vertical walls of the epidermal cells are wavy, as observed in surface view. Scattered here and there amongst the regular epidermal cells are slightly elevated stomata which appear in the material examined to be more numerous on this epidermis of the lower leaves than on the upper ones.

The cells of the lower epidermis are similar in character to those of the upper epidermis but many more stomata are evident. Glandular and non-glandular hairs are present on both lower and upper epidermis as outgrowths of individual cells. They are present in fewer numbers on the upper than on the lower epidermis. The glandular type appears to predominate. There are four kinds of these, *viz.*: (1) a one-celled stalk and a one-celled glandular head, (2) a one-celled stalk and two-celled glandular head, (3) a uniseriate stalk and a one-celled glandular head, and (4) a uniseriate stalk and a two-celled glandular head. The second type far outnumbers the others. The third type attains a length of 356.5 μ.

The non-glandular hairs appear less abundant along the margin of lamina and petiole but never in large numbers such as are found in *D. purpurea*. As in *D. purpurea* certain cells in the course of the hairs frequently have collapsed walls. The length of these hairs appears to range from 65 μ to 564 μ.

The mesophyll between upper and lower epidermis is differentiated into upper palisade and spongy parenchyma regions. The palisade region consists of a zone of long and short columnar shaped cells, one to two layers thick, which, in the regions of the midrib and stronger veins, become more or less spheroidal in character. The spongy parenchyma region consists of more loosely arranged irregularly spheroidal to spheroidal shaped cells with prominent intercellular spaces between various components. Through this region course branched collateral fibro-vascular bundles, each of which is surrounded by a distinctly clear endodermis. In these bundles xylem is uppermost, phloem beneath. The spiral type of trachea predominates in the xylem. The phloem is entirely devoid of bast fibers.

The midrib contains a broad somewhat semilunar-shaped area of fibro-vascular elements in which xylem is uppermost, phloem beneath. The xylem region contains chains of radically arranged spiral and pitted tracheae and thick walled, angular, wood fibers. The latter are always beneath the tracheae. The phloem is crescent-shaped and devoid of bast fibers. No sclerenchyma arc is present. The parenchyma cells above and below the fibro-vascular area are pitted, for the most part clear, and of rounded to polygonal outline. Occasionally, by no means always, those near the upper and lower epidermis and above and below the fibro-vascular region become slightly collenchymatic. The mesophyll cells of the lamina immediately adjacent to the midrib are not differentiated into palisade and spongy parenchyma.

HISTOLOGY OF THE STEM.

When examined microscopically, this organ shows the following characteristics, passing from periphery toward the center:

1. A protective epidermis whose cells, as seen in transverse view, vary from irregularly spheroidal to slightly tangentially elongated, with convex outer and inner walls and which, when examined in surface view, possess irregularly rectangular to elongated polygonal outlines. The outer walls of these cells are cutinized,

the cuticle in transverse view attained a thickness of 10μ. Stomata are found here and also a scattering of glandular and non-glandular hairs.

2. A cortex of varying thickness, depending upon the age of the portion of stem examined, and consisting of more or less tangentially elongated cortical parenchyma cells with simple pored walls and small to moderate sized, angular intercellular-air-spaces. The cortex cells become larger then smaller as the pericycle is approached.

3. A pericycle consisting for the most part of an irregular, interrupted circle of sclerenchyma fibers with strongly lignified walls, varying at different points in thickness from one to two or three layers of cells.

4. A phloem composed of sieve tubes, companion cells, and phloem parenchyma, but no bast fibers. Narrow, thin walled medullary rays separate this region into numerous patches.

5. A cambium of meristematic cells, forming an irregular circle.

6. A xylem about three and a half times as broad as the phloem region and composed of closely set radially arranged groups of wood fibers and spiral and pitted tracheae, separated by narrow medullary rays (1 cell wide) whose walls, like those of the wood fibers and tracheae are strongly lignified. The outer region of the xylem arms is composed for the most part of woody fibers with but few tracheae. The tracheae gradually increase in number until the inner portions of the arms show more of those structures than wood fibers.

7. Conjunctive tissue composed of cells having lignified, pitted walls separates the xylem from the next region or,

8. Pith, a broad central zone of more or less isodiametric to elongated parenchyma cells with pitted walls. Some of these cells, especially in the outer region, have lignified walls.

HISTOLOGY OF THE ROOT.

This organ, in its secondary growth, shows the following structural peculiarities, passing from periphery toward the center:

1. Several layers of tabular cork cells with brownish walls.

2. A cork cambium of meristematic cells.

3. A secondary cortex of numerous layers of tangentially elongated more or less parallel phloem patches, composed of sieve tubes, phloem cells and companion cells, alternating with narrow phloem medullary rays.

4. A cambium of irregular circular outline, composed of meristematic cells.

5. A xylem, comprising a broad central porous cylinder of numerous narrow xylem arms alternating with medullary rays, one cell wide. Each xylem arm is composed of many spiral and pitted tracheae, wood fibers with oblique slits in their walls, and wood parenchyma cells. All of the xylem elements have lignified walls.

MAINTAINING FROGS FOR TEST PURPOSES.*

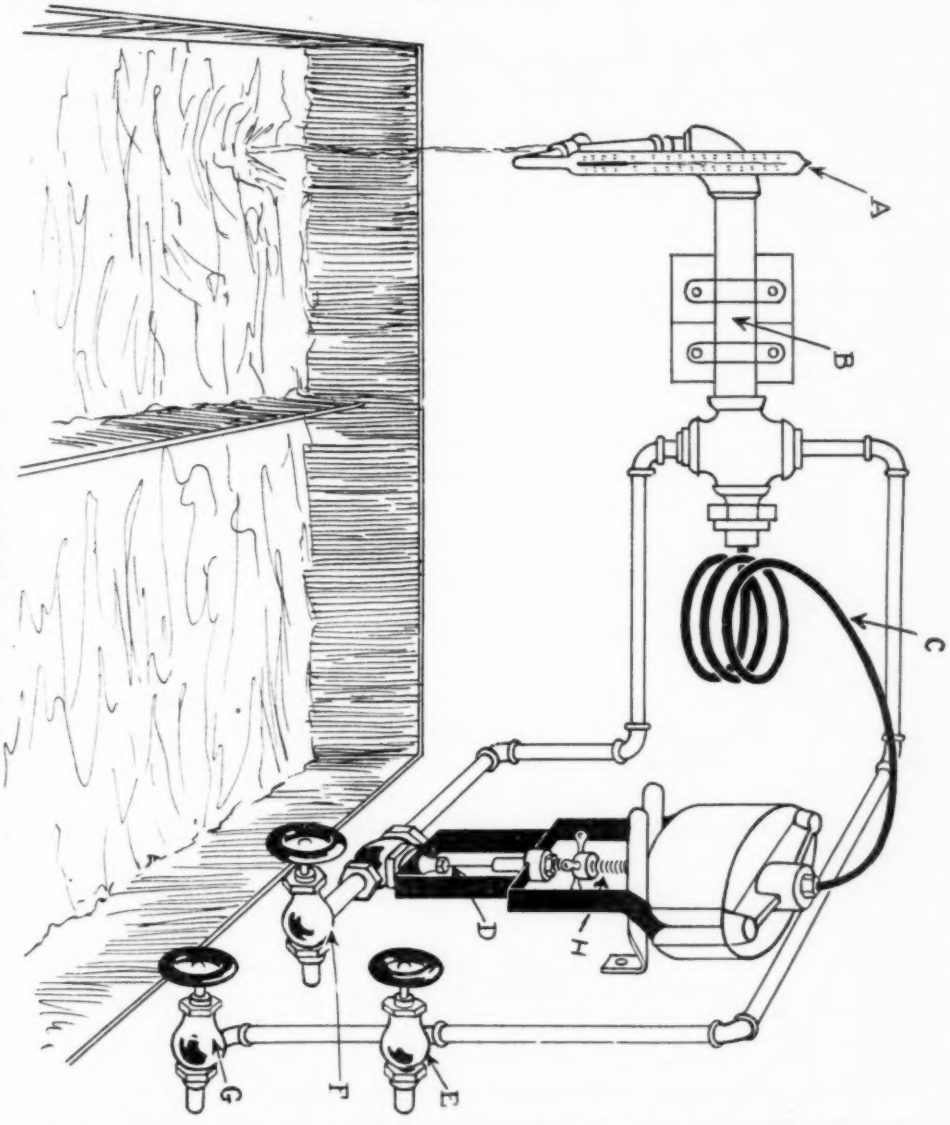
BY L. W. ROWE.

The proper maintenance of a supply of normal frogs throughout the year, when fresh supplies are not available daily, requires special facilities to avoid excessive losses and to insure uniform results when standardizing preparations of heart tonics of the digitalis series by the frog methods.

The chief source of trouble lies in the variation in temperature of the water in which the frogs are stored. In the summer the tap-water in the mains rises to 24° and 27° C., which is too warm, causing epidemics of disease to flourish among

*Read before Scientific Section, A. Ph. A., New York meeting, 1919.

the frogs. In the winter the temperature of the tap-water goes as low as 4° C. and at this temperature the frogs are too sluggish. Furthermore, in the winter the sudden change of the frogs from the very cold water to that in which the tests are conducted is not uniformly responded to even if they are placed in the warmer water an hour or two before injections are made.



Apparatus and Tank for Maintaining Frogs for Test Purposes.

It was, therefore, thought desirable in our laboratory to control the temperature of the water entering the frog tank so that it would be the same during the entire year. The task becomes more complicated when it is realized that the tap-water must be artificially cooled in the summer and warmed in the winter.

The sketch represents the arrangement of the apparatus and the tank. The tank itself is made of copper and placed in a chamber 4 ft. × 4 ft. × 4 ft., five

sides of which are sealed and insulated from room temperature by a thick layer of cork board. The sixth side is a tight fitting refrigerator door with three spaced panes of glass. Since the door is opened only two or three times a day the air in the chamber is maintained at approximately the same temperature as the incoming water. From the sketch it can be seen that three pipe lines, for hot water (E), tap-water (G), and ice-cooled water (F), respectively, supply the tank. The refrigerator for cooling the water is located below the sealed chamber. The thermometer (A) shows the temperature of the water entering the tank.

The apparatus which controls the temperature of the water which enters the tank, is known as the Sylphon Tank Regulator and is made by the American Radiator Co. A bulb containing a liquid with a high coefficient of expansion is situated in a metal jacket (B) through which the final mixture of warm and cold water must pass. This metal jacket is connected by pressure tubing (C) with a needle valve (D) in the ice cooled line. The expansion or contraction of the liquid in the bulb controls the amount of cold water which is admitted by opening or closing the valve. A spring (H) connected with the needle valve can be tightened or loosened so that any desired temperature will be necessary to open or close the needle valve.

In summer the hot water is not used at all but enough ice-cooled water is let in by the needle valve to cool a small stream of tap water to the desired temperature. In winter the temperature of the tap-water is raised to a point a little above that required, by opening the hot water valve slightly, then the needle valve lets in enough water from the cold water line (which in the winter is equivalent to a tap-water line since no ice is placed in the refrigerator) to cool the stream to the desired temperature.

To comply with specifications in the U. S. P., frogs must be kept at 15° C until wanted for immediate use.

It has been found in this laboratory that this temperature (15° C) is well suited to the proper storage of normal frogs and with the apparatus described above and the arrangement of it in the sealed chamber we are able to maintain this temperature to within about 1° C throughout the entire year, if necessary. While very sensitive to improper handling it is equally susceptible to proper adjustment and has been found satisfactory for maintaining an even temperature at all seasons.

RESEARCH LABORATORY,
PARKE DAVIS & COMPANY,
DETROIT, MICH.

PHARMACEUTICAL EDUCATION AND OPPORTUNITIES.*

BY HENRY J. GOECKEL.

The entrance of the United States of America into the "World War" no doubt, brought before the educators and other leaders in pharmacy the fact that our colleges have not prepared graduates along certain lines within the legitimate fields of the profession. The war requirements of the United States Army in particular have brought this to the fore.

To those who have looked upon pharmacy and practiced the same as an im-

* Read before Section on Education and Legislation, A. Ph. A., New York meeting, 1919.

portant branch of medical science and art, the experience of the past two years is no surprise. For years past we have occasionally read in our periodicals discussions on "What is the matter with pharmacy?" and "Why is pharmacy declining as a profession?"

Has it declined? Or, has it failed to recognize part of its mission and legitimate field of growth?

The writer is, possibly, one of a decided minority who think it has failed to read and understand the signs of the times sufficiently and accurately.

The war experience has brought out very clearly that our medical colleges cannot load up the minds of their students with excessively detailed courses of instruction in the technical, biologic and chemical branches of medical science without impairing their grasp of the clinical or physical diagnostic phases, which are the most important and probably the most difficult. Without a correct recognition of the subtle lapses from normal and a resulting correct interpretation of the same, all else is valueless. A correct diagnosis is the most important thing in medicine.

It is the writer's firm conviction, based on his experience, that the clinical pathology or laboratory diagnosis, and pharmacology are pursuits which in their requirements or qualities come more appropriately within the realm of pharmacal medicine rather than in that of clinical medicine. These diagnostic methods and the understanding of the qualities of remedial measures are such as to require a more thorough pharmaceutical and chemical knowledge than is imparted in colleges of medicine.

The training given in the usual three years of pharmaceutical education and the experience of prescription compounding are a better preliminary than the premedical and medical courses as given at our colleges of medicine. It may, perhaps, be contended that medical students receive adequate training in their two years' pre-medical chemistry. Teaching a future physician chemistry from an industrial and enginerring view, as is done in some university departments of science, is a very poor preliminary for one whose whole life's work will be in the realm of physiologic pursuits. From the writer's own experience, he believes that most of those who teach these subjects have no understanding of the requirements for such students.

Many of our colleges of pharmacy give a sort of a course in urine analysis, etc., and in bacteriology. It would, perhaps, be better if they failed to give any, as these courses certainly do not qualify their recipients, and account for the many failures among those attempting to branch out in medical laboratory work. Many of these courses at colleges of pharmacy are not as good as some of the leading training schools for nurses are giving to their students, whom they aim to qualify as office nurses or as laboratory technicians. Such graduate nurses will probably pre-empt the field for laboratory technicians, as they have a better understanding of hospital requirements than do others.

A thorough training in the field of laboratory diagnosis, etc., will better qualify graduates of colleges of pharmacy for positions in biological production and standardization, and as pharmacologists. Such training can probably only be undertaken by a limited number of our colleges of pharmacy, as part of the work must be given by the medical faculties. Such colleges of pharmacy can give all

the training for a Doctor of Pharmacy (Phar.D.) in biology and chemistry excepting a course in gross anatomy; courses in normal and pathological histology and neurology.

If the college has a well-equipped department of biology it can perhaps give the course in embryology. If it has a well-equipped department of physiologic chemistry under the direction of a trained and experienced physiological chemist and clinical pathologist, it can give the courses in these two subjects, supplementing the same by experience in hospital laboratories as do medical colleges. Otherwise these, likewise, should be given by the medical faculty. The bacteriology can better be given under pharmaceutical auspices, as the course at medical colleges are too narrow. They dwell on the pathogenic organisms, and neglect the industrial, sanitary and agricultural phases. They give sufficient for a medical doctor (M.D.), but not for a doctor in pharmacy (Phar.D.).

With the rapid advance in biological and physiological research, the time is not far off when a trained pharmacologist will be one of the regular staff of every first-class hospital. His duties will be to advise the staff as to what remedies, and what particular form of the same and what method of application are advisable. Such a hospital or community pharmacologist will also need to see that the various preparations are correctly prepared by the supply house, hospital apothecary or nurse, as the occasion requires. In October 1918, there were in the United States 4,927 hospitals with from 10 to 100 beds, and 1518 with from 100 to 500 or more beds.

A few illustrations from the writer's experience will perhaps shed light upon the gap between clinical medicine and pharmacy.

Take the white lotion, or Lotio Alba Comp., used extensively in the local treatment of acne. The success in the use of this lotion depends upon its correct pharmaceutical preparation. If the zinc sulphate is in excess, or if the sulphurated potash is of poor quality, instead of a bland lotion you will have a caustic and irritant due to the excess of zinc sulphate. No reasonable amount of manipulation of sublimed sulphur in a mortar, with or without the aid of alcohol, will reduce it to an impalpable powder. The use of precipitated sulphur is not as efficient therapeutically. I know of an instance where a physician noted the caustic action and thought to eliminate this danger by prescribing zinc sulphide in place of the usual interacting substances. A dried insoluble precipitate of this type is about as impalpable as pumice.

While an apothecary at one of the larger hospitals, the writer prepared this lotion so as to produce an impalpable precipitate. This was accomplished by saturating an aqueous solution of the sulphurated potash with sublimed sulphur, on a hot water bath. It was filtered while hot, and then precipitated in the usual manner. This was employed on hundreds of clinic cases without adverse comment. My successor prepared this lotion in the usual manner, and was promptly taken to task because of the marked difference in the results when applied. A knowledge of the therapeutic requirements was essential for the proper application of pharmaceutical knowledge.

I have seen a case where a compound zinc oxide ointment was prepared with a high grade oxide, on an ointment slab. A lot was then prepared by another prescriptionist with the usual cheaper grade of zinc oxide, and manipulated in a

mortar. The result, due to a gritty preparation, was an aggravation of the cutaneous symptoms, instead of the improvement obtained with the previous lots. It also resulted in some undesirable publicity for the pharmacy.

More recently (at an excellent clinic on burns, treated by the paraffin method), the chief of the clinic reviewed the various methods employed to treat burn cases. Among the methods was the use of warm water baths. He mentioned those claiming marked success and those reporting failure. To one with a pharmaceutical basis to a biological education it would immediately be patent that the success or failure will depend upon the temperature of the water and upon the length of time and frequency of application.

I recently saw a physician prescribe the Carrel-Dakin solution as a wet dressing on a bandaged hand. The result was an intense burn, as anyone with a good pharmaceutical and pharmacological knowledge would have expected from the group characteristics of the halogens.

These few examples tend to show that there is a gap between the physician and the pharmacist, and aid to locate the same. This is a gap which should be bridged by the pharmaceutical profession.

This is not presented as a criticism of our pharmacy graduate (Ph.G.) courses, which answer a definite need of the community. Nor to minimize the industrial and chemical fields of endeavor for which the colleges aim to qualify their graduates.

I would even urge that the commercial courses, as presented in the Ph.G. years, be made a prerequisite for such advance courses to teach value and methods, thereby to help eliminate the waste and extravagance which is so conspicuous in many hospital and clinical laboratories.

Bridging this gap will redound to the interest of pharmacy and the welfare of the community. The physician looks chiefly to the hospital for knowledge. Such training will also preëminently qualify pharmacists for success in the field of public health and sanitation. It will make untrue any charges that American pharmacy is not qualified to shoulder its responsibilities, be it in times of war or in times of peace.

CLINICAL AND PATHOLOGICAL LABORATORIES,
MUHLENBERG HOSPITAL, PLAINFIELD, N. J.

ABSTRACT OF DISCUSSION.

L. GERSHENFELD: The author has made two remarks in his paper which seem to be contradictory. He states that courses in urine analysis and bacteriology in schools of pharmacy should be optional, and then further on states that bacteriology should be taught in pharmacy schools and not in medical colleges.

H. J. GOECKEL: I said in the paper that some of our colleges of pharmacy give a sort of a course in urine analysis and in bacteriology and that it would perhaps be better if they did not give any of these courses because they did not qualify their recipients.

R. P. FISCHELIS: I must take exception with reference to some of the courses given in the institutions of Philadelphia. I know that the students who qualify in these courses are certainly fitted to do bacteriological work.

H. J. GOECKEL: I still maintain that the graduates of colleges of pharmacy, speaking from my experience, are not qualified properly for this work.

R. P. FISCHELIS: I must protest against such statement going out from this Association unless there is a basis for it. I know bacteriologists who are graduates of these very courses of

which I speak who hold important positions and have shown that they are well trained for the work.

H. J. GOECKEL: I am basing my remarks on my own experience, and I would like to have Dr. Jacob Diner speak on the subject, as I know he is thoroughly acquainted with it.

JACOB DINER: I can only agree with Dr. Goeckel in part. The teacher of the subject should have not only a theoretical knowledge of it but a thorough practical experience and he must everlastingly keep at his work. It is a mistake to make a sweeping remark to the effect that the subjects and courses cannot be given in a school of pharmacy or are not being given. Pharmacists are often better qualified for this work than the average physicians. To them it is scientific work; to many medical students it is drudgery, a subject from which they hope to pass on to what, in their estimation, is more important work. The pharmacist considers such work a privilege, in which he participates with the physician and is imbued with the responsibility involved. In my opinion the educated pharmacist is eminently qualified for this work, and in the selection of teachers regard should be had for their training and experience.

WHERE ARE PHARMACISTS TEN YEARS AFTER GRADUATION FROM COLLEGE?*

BY ZADA M. COOPER.

At various times in discussions arising in this Section or in sessions of the American Conference of Pharmaceutical Faculties, the statement has been made that, if we insist upon high school entrance requirements, graduates of colleges of pharmacy will not remain in retail pharmacy. In other words, a man or woman with four years of preparatory work and two or more years in college will be too ambitious to be satisfied with retail pharmacy, in consequence of which the clerk shortage will become more acute and the proprietor more and more overworked. It would be conceded, perhaps, by most of us, that most localities would be better off with fewer drug stores, even though the reduction in numbers were the direct result of inability to get clerks, but that is not the question. Rather, *is* it true that pharmacists who have graduated from our high schools will not remain in retail pharmacy?

Because I always doubted the probability of their leaving pharmacy to any considerable extent, and to verify my belief, I have gathered together a few figures from the College of Pharmacy of the State University of Iowa. Of course, I know that one can make statistics prove anything and I know, too, that what is true in Iowa may not be true in any other state in the Union. However, I suspect that all of the neighboring states of the upper Mississippi valley would show pretty much the same state of affairs.

During the ten year period ending with June 1918, 10.8 percent of our graduates had not been graduated from high schools, though only during the last three years of the period was there a high school entrance requirement. During the other seven years large percentages were voluntarily high school graduates. The investigation might almost have ceased at this point, for, if they chose to come to a college of pharmacy after having high school preparation one would hardly expect them to quit after graduation to go into something else.

What then actually became of these graduates? This is what I found: only 7 percent are out of the profession, 6 percent probably permanently. Closer examination of these figures revealed the fact that one-fourth of them are practicing

* Read before Section on Education and Legislation, A. Ph. A., New York meeting, 1919.

physicians, one-fourth are women who married and gave up pharmacy, one-fourth never practiced, and most of this group were not high school graduates, the last fourth practiced pharmacy for some time but had then gone into other business ventures or retired altogether. So much for those who have gone into other fields of endeavor.

Nine percent are in manufacturing or analytical lines. All of these had high school preparation and most of them have had Ph.C. degrees, but not all. Between 2 and 3 percent are teaching and these all had high school preparation or more; 3 percent have held hospital positions; 76 percent are in retail pharmacy either as clerks, managers or owners; insufficient records make it impossible to classify the remaining 2 percent. Of the whole number, 10.3 percent have had advanced work, a figure a little below the combined percentage of those who are in manufacturing or analytical work or teaching.

Probably statistics covering a twenty year period would show somewhat different results, for, naturally, more people would be retiring during the second ten years than the first. On the other hand, to go much more than a decade back would give us conditions less like those that exist now. That is particularly true of education, and conclusions drawn from a period more than ten years ago would not be of much value in present day conditions.

Perhaps some one may be wondering what became of students who did not graduate. Now that we have a prerequisite law, that is of no special concern, but before its enactment approximately one-third of the students who matriculated did not graduate. I haven't statistics as to their preparatory work, but no doubt the number of high school graduates was somewhat less than in the other groups. Records are in every way less dependable than among graduates, but I find that 75 percent stayed in the profession, 18 percent are out of it, and the whereabouts of 7 percent are unknown. A comparison of these figures indicates at least two and one-half times as many out of the profession as in the group who remained in college to take their degrees. Where I have had personal acquaintance with this group, it is evident that many of these were misfits who stayed only a short time. Of the 75 percent who continued to be druggists, many did poorly in school and quit early in the year, or at the end of one year, because of being conditioned in one or more studies. Almost none were of the sort that would spend much time in any sort of education nor were they individuals with great ambition, the reverse rather. The fact that those who did not graduate show a higher percentage of low entrance preparation, did poorer work in college, landed in plugging schools or took board examinations after short preparation and still a slightly smaller percent remained in retail pharmacy surely does not disprove our original statement. Of course we must grant that such material added just that many so-called pharmacists, if that alone is the desideratum.

Again, if a high school requirement is too high, it should keep young people from entering pharmacy at all and that such an argument is advanced we are all well aware, though that is not a question to be discussed in this connection, except incidentally. Instead of choosing something else as we might expect them to, the record in states where it is in force shows that if there has been a falling off at all, it has only been a temporary one with an early return to normal attendance and with a much more desirable class of people.

A few facts about the enrollment of the year just past may be of interest. It was a strange year in many ways and perhaps not typical, but so far as preparatory work went it did not differ much, if at all, from that of other recent years. Of the whole enrollment including the S. A. T. C., 22 percent had had one or more years of liberal arts work in addition to the required four years in an accredited high school; 8 percent did Ph.C. work. One cannot predict what they will do when they get out of college, or how long they will stay in pharmacy, but a good proportion of them intend to go into retail pharmacy. Doubtless not all of them will remain in that branch of it, for some are sure to take more college work, if not immediately then a few years later.

To come back to the original thesis, that high school graduates do not stay in retail pharmacy: granting that 7 percent leave the profession isn't that rather a small number?—and granting also that 15 percent become analysts or manufacturers or hospital pharmacists or teachers, is that not a fair ratio? Where are these branches of the profession to get new recruits if not from the output of colleges of pharmacy? Is it not better that they take their training with that end in view than that they should go into retail pharmacy and, later, when they have put all their thought and all their energy into retail problems decide to transfer? No one believes in a narrow individual and the retail experience is good to have and will make anyone bigger and broader, but the goal should be in mind from the beginning and its realization should not be too long deferred. Whatever skill they have acquired by the years of retail practice is skill that is hardly applicable to other different problems only in so far as all training is good discipline.

Again, do not the existing percentages indicate a fair ratio of retailers to other workers? I have no statistics, but I fancy it is not far from correct, and if it is wrong I wonder if it does not err in the wrong direction; that is, should we not be supplying a larger number of men and women to manufacturing and analytical laboratories? Is not the shortage there just as acute as in the retail business?

If this present ratio is about right why should we make entrance requirements low to be sure that we do not lack for clerks and trust to those who have more preparation to supply other branches? It seems obvious that such procedure would be a scaling down of quality all along the line.

"FOR THE GOOD OF THE PUBLIC"—THE SLOGAN FOR SUCCESSFUL LEGISLATION.*

BY W. H. ZEIGLER.

Webster defines the word "slogan" as the "war cry," gathering—or watchword of a clan in Scotland.

I have selected as the title for this paper "For the Good of the Public," because after years of experience on a legislative committee intrusted with pharmaceutical affairs, I believe it is the slogan or watchword to be used in all legislative matters.

I am from a State that has been first in a great many historical events, and while we cannot boast of having been the first to pass a prerequisite pharmacy law,

* Read before Section on Education and Legislation, A. Ph. A., New York meeting, 1919.

we are proud of the fact that we have always been able not only to block objectionable legislation but get everything we ask for.

The secretary of this Section, in making his report last year, wondered how South Carolina accomplished so much. I made up my mind at that time to tell you this year how we do it. Now, I assure you there is no trick in it, no graft, nor do we use some hypnotic power. What we have accomplished can be duplicated by every other pharmaceutical organization.

First of all it is absolutely necessary that you have as president of your Association a live, active man; one who is a 100 percent pharmacist, who has the good of pharmacy at heart, and is not ashamed of, or is constantly making excuses for, the profession he represents; one who does not mind the sacrifices he has to make—who is always on the job. We have had several, but for the past two years we have had one of the livest wires that has ever sat in a president's chair. And as a result we have had a good organization.

We do not boast of a large membership, for while there are in South Carolina 940 registered pharmacists, only 443 are members of the state association. But what we lack in quantity we make up in quality.

We have been fortunate also in having a strong legislative committee—one made up of men who are willing to leave their places of business and go to the Capital and stay there until they get what they want. And when they go before the Committee of Medical Affairs in the Senate or House they do their best to convince them that what they are asking for is for the good of the public—that the public must be protected. They realize that not for one moment must they allow these gentlemen to entertain the idea that it is self-interest which prompts them to ask for their endorsement.

A third factor that has played an important part in our success has been that our college is a State institution, having several members of the Legislature as trustees; and we have always coöperated with the Association and sent committees to the Legislature who worked hand in hand with them. I might mention, also, that we have in the House a graduate pharmacist, who has been of great assistance to the committee.

Last month closed the first year of our prerequisite law—the best law of its kind in the Union. An applicant must be a graduate of a school or college of pharmacy, meeting the requirements of the American Conference of Pharmaceutical Faculties, and have at least two years of high school work.

I attended the last meeting of the board of examiners, by invitation. A large number of applicants appeared for examination but only four were accepted as meeting the requirement. The total number for the first year of the prerequisite law was 15 applicants, of whom 12 were successful.

It is of interest to note that in 1914, 77 applicants were accepted for examination, 45 were successful, and 32 failed to pass. I believe this was about the average number that applied previous to the passage of the prerequisite law. Of course I found men present at the meeting this year who blamed this law for the scarcity of druggists, and wanted it repealed. Certainly the law has had a great deal to do with it, but we know that the war also played an important part.

I am satisfied, though, that the status of pharmacy in South Carolina is better than it has ever been. The pharmacists are more prosperous, not because of

the general wave of prosperity, but because there are fewer corner drug stores, less competition, and better pharmacists.

I am satisfied that the prerequisite law is the keynote of the whole pharmaceutic problem. Standardization of schools of pharmacy is necessary, no one will deny, but as long as an applicant for a license to practice pharmacy is allowed to come up for examination without high school requirements,—with a knowledge of pharmacy obtained from quiz compends and correspondence schools,—practical experience that consists of having sold patent medicines, seeds, paints, soda water, etc., pharmacy will never take its place with the other professions.

This Association should not be content until every state in the Union has a strong prerequisite law. If necessary, let us send representatives into the states without such laws, work in them, one at a time, until prerequisite legislation is enacted.

This Association has accomplished great things for pharmacy, but what we need is coöperation. We need a larger membership. We should start a campaign to enlist every pharmacist in America in the cause. I believe the South, for instance, is not well represented. Now, how are we going to accomplish this much-desired end. We made a start in South Carolina this year. The President, in his address, urged the members to join this Association, calling their attention to some of the advantages, and when he asked all who would join to stand up,—30 signified their intention of doing so. Probably very few of these men will ever attend a meeting of this Association, unless we keep in touch with them and show them why they are necessary to the success of pharmacy.

If we could get the American pharmacist to look to the American Pharmaceutical Association as the physician looks to the American Medical Association, the success of pharmacy would be assured. Why is it that on the train last month, going to Atlantic City to attend the American Medical Association meeting, there were 12 or 15 physicians from Charleston alone, while there are probably only two pharmacists from the whole State of South Carolina here to-day. Certainly it is not because the meetings are not interesting enough, or because we are not doing a great work.

I believe one of the reasons is because we do not use propaganda. It takes money, I know, but "money talks." And money spent in this manner will undoubtedly draw compound interest in the upbuilding of pharmacy.

We may as well face the facts. We meet together every year, make good resolutions, hear the reading of interesting papers and reports, but we only represent a few of the pharmacists of America. Why is the American Medical Association such a power in medical affairs? We know it is because of the large membership and the wonderful organization they have. It is because of this membership and organization that they have been able to place medicine on its present high plane.

South Carolina is with you. This year we divided our State into 14 districts, and we have already begun their organization. We are going to enlist every South Carolina pharmacist in the cause. Next year we are going to the Legislature stronger than ever. We are going to ask for $3,000 to defray the expenses of the Board of Examiners. We are going to ask for protection against the merchant who sells all kinds of drugs and brings discredit upon the honest druggist by offer-

ing for sale intoxicants in the disguise of medicines, and we expect to get this legislation passed, and perhaps more. We are going to accomplish these things by propaganda, using the newspapers, and educating not only the pharmacist, but the public as well, to the importance of pharmaceutical legislation, always keeping before them the slogan—"For the good of the Public."

I acknowledge that the ideas suggested in this paper are not new, for we have from time to time discussed the prerequisite and other laws and this Association has been of great assistance. I have only attempted to emphasize the importance of keeping forever at it, and to inform you of what we are doing in the old Palmetto State.

SELLING AND THE PHARMACEUTICAL PROFESSION.*

BY HERBERT W. HESS.[1]

We are gathered together at this time to discuss the problems of selling as related to the possible future growth of those who find themselves known as pharmacists or druggists.

You have honored me upon this occasion with the privilege of approaching your field of economic endeavor in the spirit of analysis, criticism and vision. It is my purpose, then, to attempt so to visualize your present activities that the principles involved will bring greater individual power and a corresponding commercial success.

VISION.

Let us first approach the question of your commercial growth from the personality point of view. It is literally true that "As a man thinketh in his heart so is he." The vision which you as an individual now hold worthy of realization is the motif power of your activity. If your vision is narrow, limited, or perverted due to wrong thinking, laziness, fear, distrust, failure, or a lack of self-confidence, the future picture which you realize cannot but reflect these factors. On the other hand, the extent to which you are plastic as an individual, the extent to which you are susceptible to new ideas combined with ability to think in terms of principle, these elements are fundamental and constitute a sane growth. I take it for granted that your presence here indicates an inner urge on your part to realize a personal feeling of greater power through an interchange of ideas. A convention of this kind is but the gathering together of individual influences which in the intermingling should produce a feeling of inspiration as well as a new individual vision. It is your ability to estimate value and to convert these ideas into business policy which is to give you prestige as a successful pharmacist.

Selling is the driving force of modern business effort. If greater profit is the dominant concept of our present system the executive druggist will succeed according as he comes to think in terms of those factors which bring increased sales.

The location of your store, the selection of your help, the arrangement of your cases and show windows, all these combine to draw passing humanity into your store for purchasing purposes.

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*An address before the Section on Commercial Interests, A. Ph. A., New York meeting, 1919.

[1] Professor of Commerce, Wharton School of Business Science, University of Pennsylvania.

Selling as a force involving persuasion and educational processes has not yet brought the mass of humanity to appreciate the necessity, value or possibility of its use of all things related to the drug business. When humanity comes to know just what it wishes or what it is possible as well as necessary to possess in order to realize itself in the realm of "thing" attainment and uses, then business competition will have ceased and our present system be converted into one of supplying mere demand, which is no more than order-taking. In the meantime expediency demands a scientific conception of the selling approach.

The modern drug store in its process of evolution has as its mission in a selling sense to supply the community of which it is a part with prescriptions where disease is involved, and to supply the necessities of the person where health, comfort, and immediate convenience are concerned. It is an institution built on uncertain human moods and frailties where personal desire insists upon immediate satisfaction. The drug business touches the privacy of individual life in its tragic as well as its happy moments. From the cradle to the grave—in birth, in sickness, in love, in health, in marriage, in féte and in sorrow and finally in death, with an incidental postage stamp and a necessary telephone call—in these issues has the modern drug store been conceived. I do not know of a business where the necessities of individual joy or sorrow force the multitudes so often as to the modern drug store. In reality you are a servant of the community. Your mission is service.

PROFESSIONAL VIEW POINTS.

Now the modern drug store presents a peculiar problem from the so-called professional point of view. In any analysis I am led to believe that a so-called professional or ethical idea prevails which often tends to inhibit the commercial possibilities of many. These men are so constituted mentally that they regretfully dispense their soda, look askance at their neighbor who serves lunches and utter protest against advertising efforts of doubtful remedies which the public demands. Thus caught in the influx of public demand, changing economic conditions, and their own desire for professional serenity and dignity they are exceedingly perturbed at the symbolic flow of events. What is actually happening is that all business is becoming professional. All business is having superimposed upon its activity consciousness of a right and just way of doing things. But the motif urge is created of greater demands for a greater profit. Any movement is subject to inconsistencies and evil according as that movement is subject to growth. Our conservative friends see the evil but not the growth. Again, not a business organization to-day but is subject to change in relation to growth according as human desire *en masse* demands things. From the enormous by-product commercial activities of a modern packing plant to the combined restaurant, grocery and meat market the law of growth shows the marvellous ingenuity of human vision to realize individual initiative and larger satisfaction on the part of humanity in obtaining things of use. So I would say that the history of your chain stores, the marvellous distributing system of manufacturers, the far-reaching influence of multitudes of advertisers, these influences represent real 20th century power. And that pharmacist who fails to grasp the possibility of their use in satisfying the increased demand and desire of human beings is a mere order-taker and an aristocrat. He has failed to detect the wisdom elements of modern business life.

It is true that evil is inherent in many of our relations. But as in this instance of prohibition, the day will come when the evil will finally work itself out and when the lessons learned in the ousting will but open new business possibilities. It is perfectly true that in the case of drugs society can be thought of as being served without selling initiative and endeavor. But, the druggist will no longer have the right to expect individual reward or greater financial success with unlimited possibilities of economic attainment. The pharmacist will then have limited his activity to the advice of physicians. His store will pass into a city drug department. He will have lost the zest of business.

On the other hand, I should say that the modern pharmacist who thinks in terms of satisfying the healthy factors of individual desire along with the prescription department is combining a set of forces which tend to give growth to the individual and satisfaction to the community.

Modern business is becoming professional in that we are all compelled to think in terms of principle. Everything has its use and its place. Anything is either good or evil in the life of humanity. Modern life asks for such organizations as will feed the wholesome desires of ourselves. And the druggist is professional according as he begins to eradicate the evil factors of his business with the help of others. To sell the right thing at the right time to the right person is being professional. So to organize your experiences as to interpret your store in terms of satisfying as well as creating human desire is the work of business genius. Business genius always thinks in terms of larger sales through scientific organization. Scientific organization implies getting the right help, classifying their activities and bringing such individual pressure to bear as will result in a hearty coöperation from the soda dispenser to the management itself. Each is a part of a machine, and each must do his work in order that the entire machine may do its part. Business organization always knows when to let the other fellow do his part. Business organization thinks in terms of coöperation in relation to an ideal. Individual initiative consists in the freedom of a system which constantly holds the good-will and hearty coöperation of each one in the organization. And the modern drug store brings success unto itself according as the director of its activities comes to think in these terms.

THE SCIENCE OF SALESMANSHIP.

Selling has a threefold functioning process in its relation to its customers; namely, advertising, salesmanship and an analysis of merchandizing problems. The modern druggist has the privilege of making profits from the advertising of great numbers of manufacturers. But from an immediate selling point of view advertising should be an incessant and changing force in the general store spirit. Drug stores change their spirit too little from a selling point of view. With so much done for them by others they are often neglectful of their own possibilities of increasing sales. The fact of its taking time and money constantly to change the store spirit is no argument. Many window dressers are languishing away because they are not given a chance to display their technique in the commercialization of your articles.

An expenditure on the creation of store atmosphere simply means increased profits. Advertising is so tremendously cumulative in its power that it should

not be looked upon as an expense. It is the force of selling effect which makes one's business think in terms of the future with its visions rather than being memory or a bad venture. Scientific selling will create an atmosphere which gives meaning and spirit to those who enter your store. Suggestion then does its work and desire is being established.

Scientific salesmanship is not mere order-taking. And yet how many co-workers in drug stores are simply order-takers. To hand over goods that have been asked for is not professional business. To educate people with respect to the possibility of human satisfaction in all that you possess and which they do not at the time know about is the future profit-making flowering of incessant selling effort. To know your patrons, to know their standards of living, to understand their peculiarities, to get them to think in terms of your store as the one place to which they desire to come,—these are the necessary human motives back of business as a profession. Selling is basically getting the individual or the many to appreciate your analysis of what constitutes their needs as you, an expert, see it. And every salesman should come to think of himself as an expert of the goods which he handles. The druggist has the possibility of education regarding the merits of goods which in no manner involves competition or unethical relations to the manufacturer. The extent to which the public is wrong in its judgment of many articles which it purchases, just to that extent are all druggists bound through conventions of this kind to bring such pressure to bear through publicity and policy as will at least give the public the facts. "Truth" is the advertising motto of the Associated Advertising Clubs of the World. And each business becomes truly professional according as its final sale of anything, as well as the personal services of the physician, is interpreted in terms of the facts with respect to truth and service.

Salesmanship as a science needs careful consideration within Schools of Pharmacy. Salesmanship is a profession when it attempts to unfold the possibilities of the use of things to others. And a true salesman can become influential only as he trains his own faculties. Courses of scientific salesmanship in Schools of Pharmacy would help considerably to professionalize the practical selling efforts of the future pharmacist. A course which got one to see the dignity, necessity and privilege of salesmanship would set loose new energy and new ideals for conceptions of organization non-practical without the experience. A scientific vision of the drug business would realize new conceptions of organization.

For instance, the modern drug store does an enormous soda water business. Now there are too many high grade minds performing this service in the average store. I am sure then, were I interested in the minimum of effort with maximum returns, that a system of training of youth for this work could be accomplished for entire communities. It is only when we allow the expert, through our larger institutions of learning which represent the universal application of principle, to give his contribution to each man's business that many of these selling problems will be solved.

An expert is impersonal and scientific in his analysis. He interprets things in terms of the future. When he is defective he often fails to sympathize with the past or the immediate. Nevertheless without vision we perish, and when youth in our colleges can be made to feel the selling problems of your business at the time

of life when economic traits can be built into their consciousness the drug business will have reached another plane of possible activity. Courses involving advertising, salesmanship, merchandizing, statistics and business management are vital in the creative distributive efforts of the modern drug business.

MERCHANDIZING PROBLEMS.

Selling also demands an intensive analysis of so-called merchandizing problems. Have you analyzed the possible maximum desires of your locality? If located in large cities can you get the community to feel that they can do just as well in your store as down town? Or if down town, in the spirit of wholesome competition what new conceptions of increasing individual desire can you devise? Merchandizing means an analysis of the objective factors of your community with a view to increasing the sale of goods in your community. If you sell candy, you may not sell at the right price, or the flavor may not be liked by the community. If you sell perfumery, the community does not know it. If your store is too small, what are you doing to get another? Are you located with respect to the flow of trade? What persistent ideas are you insisting that the community hold? What new line of goods could be introduced? What method of demonstrating might be introduced? And so the questions might multiply. Merchandizing is eternally analyzing the factors of the present to detect the most effective next move. The technique of mastering these principles should be given to young men during their pharmaceutical training.

Drug store architecture based on the conception of an institution serving the delights of the community as well as administering to its sickness has great possibilities. The soda fountain with its incessant drawing power; the possibility of music as a decided factor in assisting digestion—so that they will want more; the caprice of the crowd when holidays roll around; the possibility of creating a constantly new atmosphere through decoration for the season;—these are mere suggestions of the possibility of the future.

The force of the drug store is now an absolute part of the consciousness of every member of the community. The druggist is now led to supply needs rather than to feel the marvellous transforming power of raising the standard of the community in creative endeavor through his own efforts. The modern drug store can become an institution catering to those factors which please and delight the social whims of an ever-changing humanity. At least this is the analysis of what the public wants. In so far as the executive of the future attempts to correlate such desires as are increasingly pleasing to the people; in so far as service is extended consciously to the community; just to that extent has the modern pharmacist raised his possible power of expression to a new creation non-predicable at the present time. A non-scientific and bigoted period of life will always fail to see professionalism in creative processes. A knowledge of economic principles is bringing the remarkable concept that all business is professional when it thinks in terms of service in relation to supply and demand. Modern life is also revealing that professionalism is virile in its activities. Business, as such, through analysis, vision and will power gives us virility; professionalism emphasizes logic and ethics; both give us growth and attainment in the satisfaction of human desire. The individual is successful and the multitudes made happier. Such, as I see it,

are the implications wrapped up in the picture of your possible future as pharmacists.

CAPITAL—ITS RELATION TO BUSINESS.*

BY H. S. NOEL.

The amateur writer usually prefaces his composition with a dictum. The wide use of the world "capital," assigned to me as a subject, caused me to seek the dictionary, not in an effort to define the word but to determine, if I could, what liberties might be taken in covering a topic so broad in scope and character.

I find that capital refers to the amount of property owned at a specified time or used for business purposes. It is commonly referred to as an aggregation of economic goods used to promote the productivity of other goods. It is, therefore, at once patent that in such brief time as I have at my disposal only certain phases can be touched upon. The subject is a fascinating one; before starting a study of its ramifications one wonders what he will say, and after he becomes well launched he wonders where to leave off.

Capital in its relation to pharmacy is in no respect greatly different from its relation to any other business. Advertising is capital, good will is capital, a good clerk is capital, the appearance of the store is capital, service is capital, personality is capital, a good window display is capital. Only a few days ago I learned of a doctor named Fuller who passed to the great beyond and had placed on his tombstone a very fitting epitaph: "Here lies Fuller's earth." The doctor was capitalizing his death.

Most of us look upon capital as closely related to money, and yet character is more closely related to capital by far.

It is generally conceded that credit is the keystone of the arch—success. Credit is capital. Good business men know this and pride themselves on the maintenance of commercial integrity. The man who plays fair with the public and bears a reputation for integrity has an investment beyond price. The unsuccessful, the unprogressive have a hard time when credit is needed unless they can show evidence of character, ability or money. But character comes first. Given two men of equal financial resources, and other things being equal, the man of the strong character will always survive the conflict of competition and financial stress. Why? Because those men who are in a position to be of help to him understand the value of such assets as fixed principles and business integrity.

George Eliot says: "Our deeds determine us as much as we determine our deeds."

Page, in *Trade Morals*, says: "Business men require character as the chief criterion of credit."

The retailer's banking relations have greatly changed. In fact deposit banking is comparatively a modern institution. The earlier exchange of commodities was accomplished without money consideration. One class of merchandise was merely exchanged for another. Retailing has changed in other ways. Time was when long credits were in vogue. Of this was born the cash discount. Our own

* Read before Section on Commercial Interests A. Ph. A., New York meeting, 1919.

government at one time allowed four years' credit for land sales and from a year to a year and a half for custom duties.

Before the Civil War retailers made periodical trips to market. Long credits took the place of the advantages which retailers now look for in quick turnover. Bad debts were frequent, but profit margins, of course, were large. Inability to collect accounts was frequently the cause of bankruptcy.

Then came the traveling man, who made little pretense of selling goods. His visits were for the purpose of investigating credits, to make collections, etc. Manufacturers found such representatives expensive. Later came the mercantile agency, at that time unwelcome and hailed as an imposition. It was many years before the mercantile agency found favor in the eyes of merchants.

There is further evidence that we cannot refer to capital as money alone. Merchandise is capital. From the exchange of merchandise was born the money transaction—as a convenience. It is interesting to note the evolution of commercial affairs because of the relation it bears to present day methods of buying and selling. It was during the uncertain period after the Civil War that extended credit became a gamble, and the producers, anxious to secure business, yet fearful of heavy losses, began the practice of cash discounts for prompt settlements. This condition of affairs ramified into discounts for payment in ten days, thirty days and often more, and then inducements to buy in quantities through offering free goods. It would seem that the producers, anxious to maintain output and profits, were eager to dispose of the goods to the retailer regardless of the latter's ability to dispose of them. And the resulting effect on the dealer was to load his shelves, tie up his capital and involve his credit and profits.

Many manufacturers realized this and established the one-price to all plan regardless of the quantity.

There is no gainsaying the advantages of the quantity deal to the buyer who can readily turn his capital invested into cash. Unfortunately, one of the great factors that retards the progress of retailers is the lack of buying judgment that causes them to yield to the temptation of free goods and extra discounts at the cost of good credit relations with their banks, due to inability to meet current obligations, due in turn to capital tied up in stocks that not only are without profit but in time cost money to maintain.

Stocks represent capital, but are not always readily convertible. With a limited amount of cash on hand it may become necessary to borrow money in order to maintain stocks or to meet current obligations. Immediately the interest charges become a burden against stock on hand in the form of extra costs. It takes but a short time to do away with buying advantages that looked profitable when legal rates of interest are accruing against the merchandise. The returns from capital depend largely upon the use to which capital is put.

It is only in recent years that merchants have come to realize the great value of turnovers as a source of profit. Merchandising evolved through a period of poor transportation, faulty distribution, extended credits, cash discounts, free goods, etc. We are now entering into the period of a better realization of the profit-making possibilities of quick turnover. Merchants are coming to see the opportunities in range of stock rather than quantities. As distribution improves and replenishment of stocks makes it more practical, success is being measured on

the basis of how much it is possible to make one dollar earn all by itself in a given period of time. Turnover is the method by which the question is solved. Actual profits come only when goods are disposed of.

Service to the public, profit to the enterprise, may be said to be the two chief ends of business. No special skill is required at certain times to conduct business at a profit, if conditions are right. It is very probable, however, that at no time in the history of the drug business was greater care ever required than at present.

The National Association of Credit Men advises its members to study turnover. Economists everywhere, men of national reputation, strongly advise hastening the turnover as a source of profits. Druggists have told me that they believed in it, but in buying in comparatively small quantities they so frequently found themselves short of stocks. If that be true, there is something wrong with the system; such stores lack efficiency, and the condition should be remedied. As well say that one knew the windows sold goods, but it was such a bother to trim them.

Manufacturers are studying efficiency, how to make departments produce to capacity. Many of them find that turnover, the art of keeping capital working to the utmost, is their only salvation. In other words, efficiency is but a means to an end that will enable them to produce products that will produce capital, that will produce profits quickly and repeatedly. It is up to the retailer to do the same and make stocks produce the exchange medium, cash, which will, in turn, produce profits as often as possible. He may succeed fairly well without working his capital hard, but what business man is not in business to get all that he can out of it legitimately?

A wholesale salesman with an eye to the profits in the drug business recently remarked that any investment in business should not exceed its quarterly receipts. It is a good thought to retain but a modest statement because it only represents three turnovers a year, not at all what might be called a fine showing, but probably near the average. It is well to remember that the only right way to figure turnover is to divide sales *at cost*, not at selling price, by the average amount of stock on hand for a given period of time.

This salesman had listed for sale a store with receipts exceeding $36,000. The price asked for the store was $6,000. We can easily determine therefore a turnover of almost four, granting that sales at cost were 65 percent of the total volume and the average inventory $6,000.

By contrast this same wholesale salesman visits a retailer who boasts the largest stock in that part of the country—over $25,000. Annual sales will not exceed $60,000. This retailer buys extravagantly. He does not find it necessary to watch stock very carefully. He throws out his chest, talks big and buys big, makes a showing. Quite recently, according to this wholesale salesman, this retailer purchased five gross of a certain product, which it was rumored would be hard to secure later on. He saved 15 percent on the deal. He enjoys a turnover of less than two while the other druggist takes a profit on his capital invested almost four times a year. The first makes 60 percent on his money invested, the second makes 24 percent. A Rhode Island druggist said to me one time, "Yes, but at ten percent the man with the big store made a net profit of $6,000 on his sales while the other only made a net profit of $3,600." I said, "But look at the

difference in the capital invested." "Yes, I know," he replied, "But just the same the big fellow made more."

Somehow it reminded me of the newsboy who was told by a millionaire in a haughty manner to get out of the way and not to make so much noise. The street urchin replied in this way:

"You big stiff," he said, "you needn't be so ugly about it. There ain't so much difference between you and me. You're making your second million and I'm starting my first, that's all."

This observing wholesale salesman tells of a retail druggist in his territory who was for a long time the director of a bank. This druggist was a large buyer. Four years ago he was elected president of the bank. Two years ago he asked this salesman if he could manage to call once a week. He said he had learned that it paid big returns to buy oftener and not so much at a time. At present this druggist's orders are very small in size and yet the wholesaler's books show that the yearly volume increased materially. Why did he do it? Short of capital? No: He confesses that his experience in banking has taught him how to make money with money. This banker druggist learned that his bank had a thirty, sixty, ninety day turnover, and he saw a chance to try the same principle out in the store and he did.

A new store often starts with a limited amount of capital. Business prospects may seem good. The ambitious proprietor makes a big effort to capitalize every opportunity to increase business. At the end of the first year he will have a time to take inventory and to study the results of his efforts. The first twelve months roll around. His credit at the bank is sound. He has had occasion now and then to try it out. He has borrowed money to discount bills. His training as a clerk in a well-managed store serves him well. But the inventory does not appear as flattering as he had hoped it would. The young proprietor begins to realize that he has not been doing a capacity business. That is he could have handled so many more thousands during the year without proportionately increasing overhead expense. Nystrom in "Economics of Retailing" refers to this in a discussion of three phases of storekeeping. The first is that of increasing returns in proportion to outlay, the second is the stage of constant returns and the third that of diminishing returns. There is little satisfaction to be derived in making sales that cost more to produce than the gross profits amount to.

Authorities agree that the turnover is the source of the biggest profits. Strange as it may seem, however, comparatively few retail druggists are alive to the profitableness of the turnover. True, many retailers buy in small quantities, so also do retailers carry dead lines. The small orders are not always due to skilful merchandising ability by any means, but to lack of demand for the goods; that is, the druggist knows up to a certain point that it will be foolhardy to buy more because the product will get stale or old or soiled or totally unsalable. Let the smooth salesman come along with a novelty and promise of free advertising and a 10 and 5 percent discount looks like a small gold mine. The thought I would convey is that while there may be a vague idea of the value of capitalizing turnover, quantity discount appeals immediately, is a great temptation and the smaller the dealer the greater the temptation. The quantity discount road always looks

inviting; the quick turnover path requires effort and buying judgment; it takes time to demonstrate its practicality.

Some one recently related to me the story of a country merchant who hibernated in the winter and enjoyed himself. In the summer the vacationists kept him fairly busy. His town became quite a summer place in time and someone persuaded him to do a little decorating. Among his art purchases was a Japanese lantern which he hung in the middle of the store.

A woman customer saw the lantern, admired it and asked the price. The dealer said he hadn't bought it to sell, but he guessed he could get another. The woman took the lantern; he bought another. A customer purchased the second lantern. The third was disposed of, and the fourth, and then the merchant lost all patience. He stocked no more. A visitor inquired for one of the pretty lanterns. The dealer said: "Yes, I had 'em, but I ain't going to get any more of 'em. Th're too durned hard to keep in stock." That attitude seems true of many retailers. Ordering six months' supply saves the work of reordering, repricing, etc. I used to wonder when I first started in the drug business why we did not purchase everything in gross quantities. It would have saved me a whole lot of work.

I know that many clerks feel that way about it, and not a few proprietors give little thought to how long it is going to take to dispose of a quantity that they were induced to buy to effect the tremendous saving of a dozen free with a gross order. I talked with a druggist recently who had taken advantage of a soap deal. He had enough to last a solid year and he boasted that he had been able to get a good price. He never for a moment gave the matter of turnover a thought. I talked with still another druggist who was loaded up on stationery under very similar conditions. From questions I put to each one of these retailers I know full well that each of them felt that he had acted the part of the shrewd buyer, that he would be able to make a window display and have sales and make bigger profits and be spared the bother of ordering and reordering from the wholesaler.

Occasionally one meets a small retailer who is extremely shrewd in such matters, who buys the quantity, gets liberal discounts and, fully aware of his profits from turnover, gets rid of the lot in a store in which one would never think it could be done. But these druggists are exceptions, as investigations plainly show.

The thought that is uppermost in the eyes of the chain and the cut price stores is this same idea of turnover of stock. They find it possible to narrow the profits down almost to a vanishing point, yet because of rapidity of turnover they are able to make good profits. And not only do they derive them from the turnovers, but they have the advantage of all of the concessions of quantity purchases. And to be able to buy in quantities is a fine idea—provided, always provided the turnover can be maintained. Ask the successful buyer, the big business man and the auditor. They all agree as to its advantages. The question is an individual one; and every retailer should ask himself whether or not it is a good thing for him—before he buys.

Failures in the drug business are generally thought of as bankruptcy cases. As a matter of fact, this is not true. Any man who embarks in business and is unable to make a salary commensurate with his ability, plus a fair rate of interest

on the capital invested is literally a failure. Numerous as they are, they are not listed as such.

When a druggist defrays his overhead expenses out of his capital he is headed in the wrong direction and it is only a question of time before he will come to grief. Many unsuccessful merchants realize this and get out from under before the crash. Since they do not, as a rule, own the ground or building upon which the store is located, getting out is a comparatively easy matter, made more so by reason of the fact that they have very little invested in the first place.

It so happens quite frequently that failures of this kind not only involve a loss of all that a dealer has invested but a part of the whole of capital loaned him and represented by stocks and fixtures.

Mercantile agencies show only the failures in which creditors are losers. Comparatively few retailers reach that stage of failure. They either sell out or are taken over by a wholesaler, who probably has nursed the account along with an eye to the final outcome. The part that wholesalers play in keeping some stores going is a heroic one, and it frequently happens that what apparently is a failure turns out to be a success due to change of management. A prominent wholesale druggist recently remarked that in the past it was not an unusual occurrence for a wholesaler to supply financial backing anywhere from one-third to three-quarters of the amount involved. Due far more frequently to the human element involved than to the store location it often happens that the store will change hands two or three times before being put on a self-sustaining basis. It has been clearly demonstrated that the judgment of the wholesaler in so far as location is concerned is seldom wrong; but to find proper management, good buying judgment and druggists with a fundamental knowledge of business system, is not an easy matter.

In these days the concessions made by wholesalers are not as extensive as they formerly were. The wholesalers' field, however, is still one of advisory service, and many a young druggist owes a big debt to some wholesaler who has nursed him along through trials and business difficulties until he was able to do for himself. One of the chief requisites that the wholesalers ask of customers to whom they grant favors is sound character and business integrity. It, therefore, comes home to us again that character is capital.

A banker confirmed the wholesaler's remarks in speaking of the willingness of bankers to do everything possible to assist merchants in their struggle for success. The banker cited instances of service rendered customers who needed help, and for the most part it will be found that the banker will be eager to help the business man who can prove his integrity and right to the concessions that sound character warrants.

Bankers regret to see a business man fail. To wholesalers bankruptcy is a source of disappointment. They would much prefer to extend credit than to close a store. There is always hope for a store that keeps going. Once it closes it ceases to have potential possibilities.

Both wholesalers and bankers whom I have interviewed on this subject lay stress upon two great principles that are helpful in successful merchandizing: The first is the value of sterling character and business integrity and the second

the importance of a knowledge of business system and with it a definite comprehension of the possibilities of turnover.

Buying is an art; the man who can not resist the wiles of smooth salesmen, who finds it impossible to say "No" either because of innate inability or because of a desire to effect what he believes to be economies, is not a good merchandising man. There is no greater source of profits than those that have their source in capital wisely expended. There is no more rapid road to failure than the one traveled by the unwise buyer. With profit margins diminishing, quick turns are the only solutions to the problems of cut-price competition and rising markets.

Sammons, in his book "Keeping up with Rising Costs," says that in hundreds of successful stores investigated, records of turnover, sales and purchases are recorded. Every one of these stores knows its limits, beyond which it is unsafe to buy. They capitalize past experience, not by guess work but by actual records. The outlays are held down to the most profitable figures; the stocks are restricted to a prescribed number of turns.

I am told by bankers that it is this lack of specific information that handicaps the small retailer so badly. The place for profits is in the cash drawer. Time and effort are worth while in perfecting one's self on a subject that will teach how to foster the growth of profits and to stabilize stocks to a point consistent with quick turns.

There is such a thing as overdoing this question of turnover. We can afford, however, to pass it with a mention because it is not the fault of the average retail druggist.

It is not an easy thing in a discussion of this kind to clarify certain points, due to the fact that they are so closely related to other phases of storekeeping, which lack of time does not permit us to take up. It must be taken for granted that certain other conditions obtain; it must be conceded that the druggist is aware of certain other fundamentals necessary to success.

If it seems to you that I have developed my subject along a single line, it is solely because I much prefer to deal with a few basic ideas specifically, than to indulge in generalities and leave with you only a vague notion of what it is all about.

There is seldom anything new to be said on a subject of this kind. There is always food for thought, however, that may bring to the fore the necessity of changing methods or the need of greater vigilance in safeguarding certain business assets.

It is given to a very few men to cash in on themselves to the full extent of their latent abilities. The greatest liability that any merchant ever assumed is that of complacency. The men who have achieved the greatest successes are those who always looked ahead to the possibilities of greater things even after success, apparently, was theirs.

I have never ceased to admire the skill that caused a pile of bricks, sand, lime, steel and glass to become a beautiful building. The designer is the man who deserves most of the credit. And it seems to me that the creative force necessary to build a big business where there was only a small business, or none at all, is equally admirable. Only in building a business it is not the merchandise I see in the store front, nor the fixtures—it is the man back of it all.

A man's store only reflects the man.

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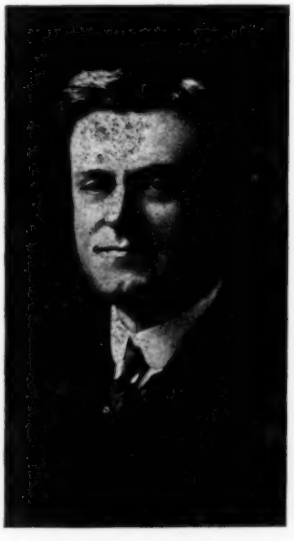
TO MAKE ALCOHOLIC PREPARATIONS UNFIT TO DRINK.

The Bureau of Internal Revenue has announced that beginning December 1, and during the week following, a series of conferences will be held between bureau officials and the manufacturers of certain alcoholic preparations to devise means to make unfit for beverage purposes such of them as cannot be legally manufactured if found suitable for drinking. The inquiry will be directed particularly to include barbers' supplies and perfumes, liquid medicinal compounds and flavoring extracts.

The enforcement of the provisions of the wartime prohibition act was restrained by a temporary injunction issued by U. S. Judge Arthur L. Brown, Rhode Island, November 12.



L. A. Seltzer,
Detroit.

F. W. Nitardy,
Brooklyn.

C. H. Packard,
East Boston, Mass.

The Three Presidential Nominees of American Pharmaceutical Association for 1920–21.

SECTION ON COMMERCIAL INTERESTS AMERICAN PHARMACEUTICAL ASSOCIATION.*

ABSTRACT OF THE MINUTES OF THE SESSIONS HELD IN NEW YORK CITY, AUGUST 28 AND 29, 1919.

FIRST SESSION.

The first session of the Section on Commercial Interests, A. Ph. A., was called to order by Chairman E. Fullerton Cook, August 28, at 9:30 A.M. All the officers were present. Otto Raubenheimer presided during the presentation of the Chairman's address.

Address of Chairman E. Fullerton Cook:

In deciding upon plans for this year's program, an embarrassment of material presented itself. One side, the market and trade situation, was of unusual importance because of post-war conditions, with its many adjustments, and an effort has been made to briefly cover this commercial interest.

Another specific field offered was that of the highly commercialized, department, drug store with its large financial, managerial, selling, and general business problems, which is rapidly demanding a place in the retail business world. While this phase of pharmacy appeals to many who have been trained as pharmacists, it finds its problems better and more fully covered by purely trade conventions, and therefore has not been specifically considered.

The side of commercial pharmacy, however, which finds a place in the interest of every pharmacist is that of scientific business training and the activities of the Section this year have, therefore, been concentrated upon such a program. Much discussion has been indulged in recently, and in fact for years past, over the old question of whether the druggist is a professional or a business man. The proposition has been advanced that two classes be established and a sharp line drawn in which the professional pharmacist is presumably to forego all business contaminations and live up to the dictionary definition of a profession, namely, "possess a liberal education or its equivalent and perform mental rather than manual labor."

To the other class is to be turned over the trading features of the modern drug business, accompanied, it is inferred, by a lower standing in the pharmaceutical, social world, but with financial returns to partially compensate for the social inequality. We are living in an age, however, where such distinctions are foolish and futile. This is a land of opportunity and the best man wins in the final contest, whether he bear the stamp of social distinction or has fought his way from the bottom, against great odds.

The discredit some would cast on business belongs to the past. To-day honesty, ability, liberal education, energy, and distinction may all be synonymous with the most successful business, and there is no place where mental rather than manual labor is in greater demand. The profession of medicine has been held up as an example of pure professionalism from which the commercial is eliminated but we need but think of the greatest medical men in America to-day, the Mayo Brothers, and see joined, hand in hand, splendid professional service and the keenest and most capable business activities.

The test of real men to-day is "service" and "purpose" rather than an artificial standard of social inequality from the past, and if pharmacy, in any of its varied phases, really serves humanity, honorably, then it is worthy of the utmost respect and a place among the best.

This academic discussion, therefore, of "professionalism" versus "commercialism" need be of little concern to the busy man who is honestly filling the place that circumstances have created.

Scientific business training in pharmacy is as important as professional training, and this combination in every college, whether of two, four or six years, will produce the trained pharmacist of greater ability. The most important universities of the land have accorded a place to scientific business in their curriculum and why should pharmacy fear its contamination, even for those fortunate few who can secure the Bachelor or Doctorate degrees in their scientific training?

The Commercial Section has, therefore, endeavored to present the basis for a scientific business training for pharmacists and has enlisted the coöperation of men who speak with authority. The papers are necessarily condensed but aim to give the essentials of the subject and to

*Papers with discussions will, hereafter, be printed apart from the minutes. It is understood, unless otherwise stated, that the papers were referred to the Publication Committee.

inspire an interest which will mean further investigation. Your Chairman has had in mind also the possibility that this series of papers might form the basis for a reference or text book on commercial pharmacy for druggists, to be edited by a committee of the Association, published by the Association, and offered to the colleges for use in their commercial departments.

I therefore suggest that the Section recommend to the Council of the American Pharmaceutical Association that a committee be appointed to prepare a copy for a text book on commercial pharmacy, using such material as may be available from papers presented to the Association in this Section, during this and former years, of course giving due credit, and adding what may be necessary, and that the Association then publish this book for use in the commercial departments of our colleges of pharmacy and for general sale. It is further recommended that any profit derived from its sale be used for the publicity work of the Association.

If pharmacists could have figures at their command which indicated the average relationship existing in the retail drug store between sales, first cost, expenses and net profit, especially if by departments, it would prove of tremendous value in controlling and adjusting business. I therefore recommend that a committee be appointed by the Chairman of this Section to collect such information as is available on this subject and report at the next annual meeting.

It is gratifying to note the development of pharmacy along scientific lines, and that this has already been made a commercial success in many places. Every encouragement should be given to this development and where it has been practicable to start clinical and bacteriological laboratories, trained pharmacists have been found ready to take up the work.

The most ultra scientific in pharmacy may also look with pride upon the record pharmacy has made in its response to the large moral questions of the day, which are so closely related to the business. Narcotic control, the campaign against venereal disease and its improper treatment, large sanitary community and home problems, and the prohibition situation, have all faced the pharmacist and in not one has he failed to respond actively and on the right side. Government officials have repeatedly praised pharmacy for its coöperation and valuable aid in the endeavors to enforce these laws and the right.

Following the recommendations of the By-Laws of the Association related to Sections (Chapter IX, Article VII) last year's Chairman proposed a subject for presentation to all state association meetings for discussion, with the request that a report be made of the discussion and this presented to the A. Ph. A. at this session. The subject suggested was "Pharmacy and Pharmacists after the War." As conditions were so materially changed by the unexpected signing of the armistice, officers of the Section this year felt that it would be unwise to ask for general discussion on this subject and therefore took no action.

Your Chairman has also felt that the plan possessed little merit and will therefore leave it to the Section to take such action this year as they may think proper concerning this recommendation of the By-Laws.

Respectfully submitted,

E. FULLERTON COOK.

On motion of C. H. LaWall, which met with a second, the Chairman's address was referred to a special committee of three.

The following papers were read, discussed and referred to the Publication Committee:

"Review of the Drug Market," by Harry B. French.

"A Workable Drug Store Policy that Will Win Success," by Henry E. Hynson.

"The Essentials of Accounting," by C. P. Couchman.

"Records—A Key to Business Success," by E. Fullerton Cook.

"Closer and More Profitable Relations between the Pharmacist and His Bank" (See p. 750, September issue), by Clarence O. Bigelow.

"Capital—Its Relation to Business" (see this issue of the JOURNAL), by H. S. Noel.

The Chairman appointed the following Nominating Committee: R. P. Fischelis, C. O. Lee and Jacob Diner.

The following committee was appointed on the Chairman's Address: Charles W. Holzhauer, C. H. Stocking and E. G. Eberle.

The first session of the Section on Commercial Interests was then adjourned.

SECOND SESSION.

The second session of the Section on Commerical Interests convened August 29 at 9:30 A.M. Chairman E. Fullerton Cook presided.

The following papers were read, discussed and referred to the Publication Committee:

"Possibilities of Manufacturing in the Retail Drug Store," by George M. Beringer, Jr.

"The Business Points in Establishing a Diagnostical Laboratory in the Pharmacy," by Jacob Diner.

The report of the Committee on the Chairman's Address was read by C. H. Stocking; on motion, being duly seconded, the report was adopted. It follows:

REPORT OF COMMITTEE ON CHAIRMAN'S ADDRESS.

The address of the Chairman of this section contains two recommendations. The first of these reads as follows:

"I therefore suggest that the Section recommend to the Council of the A. Ph. A. that a committee be appointed to prepare copy for a text book on commercial pharmacy, using such material as may be available from papers presented to the Association in this Section, during this and former years, of course giving due credit, and adding what may be necessary, and that the Association then publish this book for use in the commercial departments of our colleges of pharmacy and for general sale. It is further recommended that any profit derived from its sale be used for the publicity work of the Association."

In compliance with the suggestions set forth in the above recommendation, the committee recommends that the matter be referred to the Council of the Association for its consideration.

The second recommendation reads as follows:

"If pharmacists could have figures at their command which indicated the average relationship existing in the retail store between sales, first cost, expenses and net profit, especially if by departments, it would prove of tremendous value in controlling and adjusting business. I therefore recommend that a committee be appointed by the chairman of this Section to collect such information as is available on this subject and report at the next annual meeting."

It is recommended that such a committee be appointed and instructed to carry out the provisions of this recommendation.

(Signed), CHARLES W. HOLZHAUER,
E. G. EBERLE,
CHARLES H. STOCKING.

The reading of papers was continued:

"The New Employee—How to Select Him and Improve the Personnel of an Organization," by Earl H. Cone.

"Insurance for Druggists" (see p. 832, October issue THIS JOURNAL), by S. S. Huebner.

"Conservative Investments," by Homer H. Pace.

"Selling and the Professions," by Herbert W. Hess.

"Drug Store Advertising," by Robert P. Fischelis.

"Buying—How, When and Where—for a Retail Drug Store" (see p. 837, October issue THIS JOURNAL), by Charles W. Holzhauer.

The Nominating Committee presented its report, which was accepted; thereupon the ballot was spread and the following officers elected for the ensuing year: *Chairman*, H. S. Noel, Indianapolis, Ind.; *Secretary*, C. O. Lee, LaFayette, Ind.; *Associates*, A. B. Nichols, Phila., Pa.; Wm. P. Harrison, Richmond, Va.; Russell, Blackwood, Phila., Pa.

Mr. Blackwood expressed his appreciation of the work done during the year and at the Convention by the officers of the Section on Commercial Interests. He stated that these sessions had been the most successful he had ever attended, and moved a vote of thanks for the retiring officers. Charles W. Holzhauer assumed the chair for the time, and put the motion, which was seconded, and unanimously carried.

The Section on Commercial Interests was then adjourned.

SECTION ON PRACTICAL PHARMACY AND DISPENSING AMERICAN PHARMACEUTICAL ASSOCIATION.*

ABSTRACT OF THE MINUTES OF THE SESSIONS HELD IN NEW YORK CITY, AUGUST 27 AND 28, 1919

FIRST SESSION.

Chairman R. W. Terry called the first session of the Section on Practical Pharmacy and Dispensing to order at 2 P.M., August 27. Secretary Edward Davy was not in attendance at the Convention, and E. A. Ruddiman was selected to act as Secretary, *pro tem.* The address of Chairman Robert Wood Terry follows:

A glance at the program indicates there are so many able contributors to the activities of this Section that I feel it would be a waste of valuable time and an imposition on the members present for me to deliver a lengthy address, however much I might desire to do so.

Much has been said regarding the evils of "commercialized pharmacy" and the inroads it has made upon "ethical pharmacy." No one can contradict this; but we must not have family quarrels, as that will do nothing but retard progress and work against us. Pharmacy must co-operate with itself.

Peculiar as it may seem, I welcome all this commercialism, simply because it hastens the day when the public will see the necessity for the separation of commercial pharmacy from ethical pharmacy. The initiative must come from the ranks of pharmacy itself, but the public must be willing, and will therefore have to be educated to the necessity for the changes.

I am convinced that in the average pharmacy the prescription department is not a financially remunerative department, and that it is kept up merely from custom and weight of public opinion. Figuring in dollars and cents the store would be better off if it discontinued this department, so that the space, money invested, and expensive professional clerk hire could be devoted to more profitable work. Let those who desire to practice commercial pharmacy, which is as honorable as any other line of human activity, do so. Commercial pharmacy is an absolute necessity, hence it is here to stay; but the ethical pharmacy can exist only when the commercial store will absolutely discontinue the prescription department and discontinue the sale of all but simple packaged remedies. It must be a get-together community proposition, and then the one who desires to practice professional pharmacy could afford to discontinue all side-lines and put all his energy and resources in one line. This would be a benefit to all parties concerned, particularly the public.

It will then in course of time be necessary for the various state boards of pharmacy to have a double standard for pharmacists. One might be so radical as to predict the necessity for periodic examination of those who desire to practice ethical pharmacy. This would be raising the standard of the profession far above anything ever before contemplated.

The thoughts regarding the separation of ethical and commercial pharmacy have been enumerated many times before and by persons far more competent than I, and I might continue, but what is more desirable is *action*. I truly hope that some community will have a meeting composed of pharmacists, physicians and representative business men, and try this plan. I am confident of its success.

I desire to call your attention to the necessity for more prompt delivery of papers or titles, intended for the annual meetings, to the Section officers. The officers of these Sections are under a heavy strain from work and worry, endeavoring to obtain sufficient papers for the program. I sincerely trust that in the future contributors will respond early to the letters of the Section officers.

In closing, I again desire to thank the Section for its confidence in conferring upon me this high honor; but I must say that if these meetings are successful the credit is due to the contributors of these valuable papers, and I take this opportunity to heartily thank them for their co-operation.

ROBERT WOOD TERRY.

During the reading of the address, Samuel L. Hilton presided. On motion of Otto Raubenheimer, and a second by William H. Glover, the address was referred to the Publication Committee.

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*Papers with discussions will, hereafter, be printed apart from the minutes. It is understood, unless otherwise stated, that the papers were referred to the Publication Committee.

Chairman Otto Raubenheimer, of the Committee on A. Ph. A. Recipe book, presented his report (see Minutes of Third Council Session for 1918–1919, November 1918 issue of THIS JOURNAL). The report was referred to the Council.

The following papers were read, discussed and referred to the Publication Committee:

"Fluidextract of Licorice," by Anthony Armentano.

"The Function of Glycerin in Some U. S. P. and N. F. Preparations," (see THIS JOURNAL, October 1919, p. 818), by E. A. Ruddiman.

"A Prescription Clinic," by Ivor Griffith and A. B. Nichols.

"Standardization of Dispensing Pharmacies," by L. E. Sayre.

"Practical Pharmacy and Dispensing in Relation to the Medical Profession," by F. E. Stewart.

"Inorganic Incompatibilities of Organic Drugs," by Carl Braubach.

"Protective Ointments Against Mustard Gas" (see THIS JOURNAL for October, p. 824), by John M. Williams.

"Tincture of Cantharides," by F. W. Nitardy.

"Proposed Changes in the Soaps of the Pharmacopoeia" (see October issue of THIS JOURNAL, p. 813), by E. V. Kyser.

"The Use of Hydrogenated Oils and Fats in Pharmacy" (see p. 816, October issue of THIS JOURNAL), by C. A. Mayo aud E. V. Kyser.

"Some Suggestions for National Formulary Revision" (see THIS JOURNAL, September issue, p. 745), by W. L. Scoville.

Nominations for officers of the Section were called for. E. A. Ruddiman, of Nashville, Tenn., was nominated for *Chairman*. Ivor Griffith, of Philadelphia, was nominated for *Secretary*. F. W. Nitardy, of Brooklyn, N. Y., and W. R. White, of Nashville, Tenn., were nominated for Associates of the Section.

SECOND SESSION.

The second session of the Section on Practical Pharmacy and Dispensing was called to order at 2.30 P.M., August 28, by Chairman R. W. Terry.

Owing to the illness and absence of Professor H. P. Hynson, the contribution on "One Thousand Consecutive Prescriptions in 1919, Compared With An Equal Number in 1859, 1879 and 1899," was not presented.

The paper, "A Study of the Pendent Drop," by John Uri Lloyd, was read by title and referred to the Committee on Publication.

The following papers were read, discussed, and referred to the Publication Committee:

"Notes on the Precipitation of Magnesium Hydroxide," by Robert W. Terry and E. D. Davy.

"Notes on the Suspension of Solids in Liquids," by F. W. Nitardy.

"The Abuse of the Shake Label," by J. Leon Lascoff.

"A Suitable Non-Alcoholic Solvent for Acetylsalicylic Acid," by I. A. Becker.

"Solution of Cresol Compound" (see September number THIS JOURNAL, p. 759), by S. L. Hilton.

"Camouflage" (see September issue THIS JOURNAL, p. 752), by S. L. Hilton.

"Dreuw's Paste or Ointment or Vienna Paste," by Otto Raubenheimer.

"Ferrum Reductum," by Charles H. LaWall and J. W. E. Harrisson.

The following papers were read by title and referred to the Publication Committee:

"A Prescription Difficulty," by P. J. Kolb.

"The Refractive Index and Optical Rotation of Commercial Volatile Oils," by Azor Thurston.

"The Extraction of Cascara and Senna," by William R. White.

"Solution of Chlorinated Soda, U. S. P., from 1840 to 1920," by H. A. Langanhan and F. W. Irish.

"A Standard Screen Scale for Testing Sieves," by U. S. Bureau of Standards.

The Section approved of the tentative standards and referred the latter paper to the Council.

The following paper was presented by F. W. Nitardy: "Alcohol and Prohibition." After

considerable discussion the Section passed a motion that this paper be referred to the Council with the recommendation that the formulas be submitted to the U. S. Treasury Department.

ALCOHOL AND PROHIBITION.

BY F. W. NITARDY.

With the advent of prohibition the status of alcohol as industrial and medicinal material should receive careful consideration. The nation has declared itself in favor of prohibition and as interested parties in the use of alcohol for purposes other than beverage we owe a duty to ourselves and the public in seeing that the legitimate use of alcohol is safeguarded as well as that it and its preparations are not misused to the end of defeating the prohibition amendment.

Whether or not alcohol as such is of sufficient importance as a remedial agent to make it desirable to preserve its use to the public and with it its almost certain abuse by the public, is a matter for the medical profession to decide. It is, however, well within the province of Pharmacy to suggest a modified form of alcohol of such composition that it cannot readily be used as, or converted into a beverage and is at the same time fit for external use as liniment or bathing alcohol. We should even consider the inclusion of such a preparation in the coming issue of the Pharmacopoeia or National Formulary. The restriction of the public to alcohol of such a nature will simplify the question of abuse and relieve the pharmacist of undesirable responsibility.

We should be able to learn from and profit by the experience and actions taken by states who have been dry for some time and have definitely fixed the status of alcohol by law, and in this connection desire to call your attention to the Alcohol Law of Colorado. It provides for the sale to the public of alcohol in two modified forms only—one consisting of grain alcohol containing one-tenth of one percent of croton oil, the other consisting of a mixture of alcohol and water containing one-tenth of one percent of tartar emetic. The latter is especially intended for bathing purposes.

The formulas were adopted after joint and careful consideration of the subject by Medical and Pharmaceutical Associations of the State and have to the best of my knowledge proven satisfactory to all parties concerned.

As such alcohol is thoroughly denatured, it seems that it may even be possible to have these formulas recognized by the Revenue authorities as satisfactory for tax free alcohol.

I understand that there is a bill before Congress concerning industrial alcohol with the object to provide for less restriction in use of tax-free alcohol. I also understand that the Government is ready to receive suggestions in relation to this subject. Pharmacy is vitally interested in the matter and we should see to it that legislation of this nature receives the careful attention from us that it needs.

A communication from Chairman I. A. Becker, of the Sub-Committee on Photographic Formulas A. Ph. A. Recipe Book, entitled "Some Fundamental Considerations in Dispensing Photographic Formulas," was read and referred to the Publication Committee.

Then followed open discussion on the forthcoming revision of the U. S. Pharmacopoeia and National Formulary.

The paper on "Oral Hygiene and Oral Antiseptics," by W. F. Gidley, was read by title and referred to the Publication Committee, also a paper on "Ointment Difficulties," by William Gray (see p. 746, September issue of THIS JOURNAL).

Further nominations for officers of the Section were called for, but none were presented. The following were elected officers for the ensuing year:

Chairman, E. A. Ruddiman, Nashville, Tenn.; *Secretary*, Ivor Griffith, Philadelphia, Pa.; *Associates*, F. W. Nitardy, Brooklyn, N. Y., and William R. White, Nashville, Tenn.

The officers were installed by the retiring Chairman, R. W. Terry, following which the Section on Practical Pharmacy and Dispensing was adjourned.

FLUIDEXTRACT OF GLYCYRRHIZA.*

BY ANTHONY ARMENTANO.

Fluidextract of Glycyrrhiza has always been a source of much trouble and annoyance on account of the fact that precipitation has been so copious and has continued for so long a time, and filtration has always been so slow and difficult, and had to be resorted to a second or third time as the fluidextract aged.

Precipitation has always been copious whenever ammonia water has been a part of the extracting menstruum, no matter what proportions of alcohol, water and glycerin have been used, and seems to be the disturbing factor, probably by its saponification or solution of inert material consisting chiefly of a resinous body, which, upon the aging of the finished fluidextract is thrown out of solution and causes difficulty in filtration. In every case when alcohol has been used in the extracting menstruum this difficulty has perhaps been increased.

The present official method consists of extracting the drug with a mixture of ammonia water and chloroform water and alcohol is added to the concentrated percolate in sufficient quantity to throw out a portion of inert matter and to preserve the product. The finished fluidextract is directed to be set aside seven days, the clear liquid decanted and the balance filtered and the filter washed with enough of a mixture of alcohol and water in proper proportion to make up the original volume. Here is where the difficulty arises, and one filtration never suffices.

Various methods of exhausting glycyrrhiza with water have been tried. The method of the British Pharmacopoeia is to treat the drug by maceration and expression, repeated once, with cold chloroform water. This produces a preparation of good flavor and is easily filtered but does not exhaust the drug. Repeated maceration and expression will accomplish this, but the volume of water required is so great as to consume too much time when conducted on a large scale and requires great care to prevent souring.

Experiments were conducted using water at 150° F. to exhaust the drug. This was a great improvement, but it was finally found that the best results were obtained by the use of boiling water. The drug should not be boiled with the water, but the water should be at the boiling point when the drug is mixed with it and should be boiling when poured upon the drug contained in a percolator.

For convenience in describing the exact method used for making a fluidextract as above referred to it will be assumed that it is required to make a lot of ninety-six pints.

Moisten 100 pounds of coarsely ground glycyrrhiza with 100 pints of boiling water. Cover tightly and macerate overnight. Pack in a percolator in which the diaphragm is perfectly covered with good filter paper and about three inches in depth of clean sand distributed evenly over it. The drug should be firmly but not tightly packed. A diaphragm should be placed upon the top of the drug and weighted down with large pebbles or other convenient device.

Boiling water should now be poured upon the drug and the percolate allowed to run about 100 pints per day until the drug is exhausted. About 500 pints will be sufficient.

If the percolate cannot be evaporated at once, one-half percent of chloroform should be agitated with it to preserve it, but the best practice is to evaporate as soon as possible. It is

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* Read before Section on Practical Pharmacy and Dispensing, A. Ph. A., New York meeting, 1919.

necessary also in making the preparation in large quantities to sprinkle the drug with a little chloroform when packing and to use a little more each day.

The percolate should be evaporated *in vacuo* or on a water bath to 76 pints, cooled, 20 pints of alcohol added and allowed to stand 24–48 hours, and filtered. Product 96 pints.

An assay of this fluidextract as to the glycyrrhizin content and total extractive gives results equal to those of a fluidextract made by the official process.

A sample is submitted of a fluidextract made May 26, 1919, and filtered on the day made to determine how much precipitation would occur under the most favorable circumstances.

One item of interest is that the fluidextract filters very rapidly and leaves very little residue on the filter.

To a sample of the same lot of fluidextract was added a few drops of ammonia water. This caused an increased precipitation without corresponding advantage and was discarded.

It must be borne in mind that in making this preparation in quantities of 1000 mils the physical conditions will be somewhat different as, for instance, the drug will become quite cold in macerating overnight, and this small amount will not keep as hot as a larger volume will, so a larger amount of percolate will have to be run out.

The initial easy filtration and the subsequent freedom from precipitation recommend this process and product as all that can be desired.

LABORATORIES OF
E. R. SQUIBB & SONS.

ABSTRACT OF DISCUSSION.

MR. RAUBENHEIMER: It has always been my opinion that in order to extract the glycyrrhizic acid from the licorice, we use ammonia water. From my own experience, I find the addition of a small amount of ammonia water to any licorice preparation always improves that preparation; I have no trouble whatsoever with any precipitation.

MR. HEARN:[1] The method I use, and it has been very satisfactory, is the percolation of the drug with thirty percent alcohol and then a consequent driving off of the alcohol, bringing up the liquor left in the still to the volume required. Percolation with 30 percent alcohol extracts the licorice, and leaves the inert material in the drug without any precipitation. Frothing is avoided, as there will be no frothing until all the alcohol has been distilled off.

DREUW'S PASTE OR OINTMENT OR VIENNA PASTE.*

BY OTTO RAUBENHEIMER.

The announcement of the paper "Ointment Difficulties," by William Gray, for the second session of the Section on Practical Pharmacy and Dispensing, prompts me to write this short paper on the day previous, namely, on Wednesday, August 27, 1919. The subject herewith presented is of great importance to the practical pharmacist, as it presents three different kinds of "Ointment Difficulties," *i. e.*, 1, as to proper formula; 2, as to method of dispensing; 3, as to confusion of names.

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[1] This is the name reported by the Secretary of the Section and also by the reporter.

* Read before Section on Practical Pharmacy and Dispensing, A. Ph. A., New York meeting, 1919.

CORRECT FORMULA.

This ointment has been originated by Prof. Dreuw, the successor of the celebrated Berlin dermatologist, Dr. Lassar. Many formulas have been published, some entirely different from the original. A Formula Book published by a pharmaceutical journal gives a formula under the title *Druew's Paste* containing salicylic acid, pyrogallol, purified wood tar, zinc oxide, soft soap and anhydrous wool fat. Only lately an American drug journal copied a formula from the *Journal Suisse de Pharmacie* as "Unguentum Dreuw" containing yellow petrolatum. These two examples (and no doubt there are many more) prove again that a reliable book of formulas is needed, badly needed, such as proposed in the A. Ph. A. Recipe Book.

The following formula was given to me by a physician, who took a postgraduate course of dermatology under Professor Dreuw:

Salicylic Acid	10 Gm.
Oil of Birch Tar, Chrysarobin, of each	20 Gm.
Wool Fat, Soft Soap, of each	25 Gm.
To make	100 Gm.

Dreuw's Ointment is extensively used by dermatologists, quite especially in the treatment of psoriasis.

DISPENSING.

This ointment is a "sticker," and many a portion have I thrown away and other portions, unfit to use on the human skin, have I applied to a "mangy" dog, and with success. The principal trouble or incompatibility exists in the action of the salicylic acid on the soft soap. This conclusion was arrived at from the fact that when the salicylic acid was omitted or, on the other hand, when the soft soap was left out, no trouble was experienced in preparing a smooth paste. After numerous experiments I found the following method the best to produce a nice homogeneous soft ointment. It consists of three steps: A. Incorporate the finely powdered salicylic acid with the oil of birch tar and then gradually mix in the chrysarobin. B. Mix together the wool fat and soft soap. C. Mix B and A and dispense in a jar or wide mouth bottle.

CONFUSION OF NAME.

Dreuw's Ointment, for some reason unknown, very likely to coin a euphonious name, easy to remember, was christened "Vienna Paste" by the physicians in a large dermatologic hospital in New York City. From here, the "would-be" center of medical science, this name has spread or will spread throughout the United States. However, it should be remembered that "Vienna Paste" is a well-known synonym for Potassa cum Calce, official in N. F. This is a mixture of equal parts of potassium hydroxide and calcium oxide and is a strong caustic which, of course, should not be dispensed when Dreuw's Ointment is ordered under the name of "Vienna Paste." The results would be almost as disastrous as when "Roach Sault" is dispensed when "Rochelle Salt" is wanted. After all, let carefulness be the chief motto of the dispensing pharmacist!

NOTES ON THE SUSPENSION OF SOLIDS IN LIQUIDS.*

BY F. W. NITARDY.

Pharmaceutical practice occasionally requires the suspension of powders in an oily or fatty vehicle. When such powders are of greater specific gravity than the vehicle and the latter is liquid, semiliquid or not solid at all temperatures at which it is apt to be stored, separation by settling usually occurs. Such separation may prove very annoying, especially in soft ointments and oily suspensions intended for hypodermic use. This separation, however, may be avoided, if the presence of water in the mixture is not objectionable, by the emulsification of the vehicle which makes a practically permanent suspension possible. In other words, the suspension of water in oil or oil in water acts as an effective barrier to the settling out of a finely divided solid even though the latter be quite heavy. Let me explain further by taking a practical example under consideration.

Mercuric salicylate is frequently prescribed for hypodermic or intramuscular injection in oil suspension. If powdered mercuric salicylate is triturated with almond oil so that each mil of the mixture will contain 0.13 gramme of the drug, settling becomes evident immediately on standing. In an hour about one-third of the powder will be deposited, while practically all of it will be deposited in twenty-four hours.

If the same mixture is made, except replacing a portion of the oil with anhydrous lanolin and water representing 20 and 5 percent of the finished volume respectively, no settling of the powder is noticeable, even on standing several weeks. On prolonged standing, a trace of clear oil will usually separate at the top but this is easily re-incorporated by shaking.

For the purpose of comparing the relative stability of the above described suspension, 10 mils of each were placed in a small graduated cylinder and kept under observation for a time. The result is shown in the following table:

Observation taken.	Mercuric salicylate in almond oil.	Mercuric salicylate in almond oil, containing 20% lanolin and 5% of water.
30 minutes	0.15 mil mercuric salicylate deposited on bottom	....
1 hour	0.25 mil mercuric salicylate deposited on bottom	....
3 hours	0.45 mil mercuric salicylate deposited on bottom	....
5 hours	0.55 mil mercuric salicylate deposited on bottom	....
6 hours	0.58 mil mercuric salicylate deposited on bottom	0.2 mil oil on top
7 hours	0.60 mil mercuric salicylate deposited on bottom	0.25 mil oil on top
24 hours	0.78 mil mercuric salicylate deposited on bottom	0.3 mil oil on top
2 days	0.75 mil mercuric salicylate deposited on bottom	0.6 mil oil on top
3 days	0.75 mil mercuric salicylate deposited on bottom	0.8 mil oil on top

At the end of 3 days there was practically no mercury salicylate left in suspension in the oil and it required vigorous shaking for about five minutes to reincorporate the powder which had settled out. No precipitation of mercury salicylate is visible in the mixture containing lanolin and water, even on standing several months, and the small amount of oil separating at the top is easily reincorporated by shaking. Further, the emulsion could be so adjusted that no oil will separate from it.

LABORATORIES OF E. R. SQUIBB & SONS.

* Read before Section on Practical Pharmacy and Dispensing, A. Ph. A., New York meeting, 1919.

COMMITTEE REPORTS

REPORT OF COMMITTEE ON PHYSIOLOGIC ASSAYING OF THE AMERICAN PHARMACEUTICAL ASSOCIATION.

Owing to several unavoidable delays, the Committee was not completely organized until February of this year, and after organization the exigencies of abnormal conditions due to the war resulted in such an enormous increase in regular routine work that it was impossible for the members of the Committee to attempt any researches which were not absolutely essential.

We beg, however, to submit the following report of our work to date:

The incorporation of the chapter on "Biologic Assays" in the U. S. P. IX is epochal in the history of standardization and it is to be hoped that with this start a much wider publicity and experience will be gained so that the next Committee of Revision will readily be able to select from the proposed methods and make official the methods and technique which prove to be the most satisfactory and convenient for each drug.

The Committee is unanimous, however, in its opinion that the biologic assay methods of the U. S. P. IX are unsatisfactory, due to the fact that in many cases *they lack the details* which workers in the practical laboratory have found essential in order to obtain accurate results.

In other words, the methods are in many instances *not as accurate and up-to-date* as the methods in common use at the present time in the commercial laboratories.

Specific criticisms of the U. S. P. methods are given in the following four papers by members of this Committee:

"Biologic Standardization, by H. C. Hamilton. *Amer. Jour. of Pharm.*, Feb. 1917.

"The Physiologic Standardization of Cannabis," by W. A. Pearson, J. A. PH. A., Nov. 1916, p. 1194, and Oct., 1917, p. 876.

"Biologic Standardization of the Heart Tonic Preparations." By H. C. Colson, Jr. J. A. PH. A., 1918, Vol. 7, No. 1.

"Biologic Assay Methods of the U. S. P. IX." By Paul S. Pittenger, J. A. PH. A., Oct. 1917, p. 865.

The above papers show very conclusively that many of the shortcomings of the U. S. P. Biologic Methods are due to the fact that the Revision Committee failed to give due consideration to the viewpoint of the manufacturer.

"The importance of this feature is in the fact that the manufacturers were in many instances the originators of the tests in use, and had of necessity developed them from scientifically interesting facts to a practical working basis. These manufacturers through years of experience were in a position to eliminate the non-essentials and to arrive at some common ground by compromise. A method which under certain conditions can be made fairly satisfactory may fail entirely when attempts are made to apply it under practical working conditions." (Hamilton).

Owing to the facts stated, very little attention has been paid to the methods of the U. S. P. IX as all evidence tends to prove that they are less accurate and reliable than the methods in common use.

It is only natural that pharmacologists should differ in their opinions as to which reaction more nearly represents the activity of a drug, when it has more than one therapeutic use, and that each worker should be partial to the method with which he has had the most experience.

Your Committee feels, therefore, that it bears the responsibility of a very important part of the work of this Association and that *it is the duty of its members to coöperate in a thorough, impartial investigation as to the relative applicability, degree of accuracy and ways of improving the various biologic assay methods.*

It was decided that we first adopt a definite plan of work for the Digitalis series and after this was well under way that we decide upon definite plans of work for Epinephrin and products of the Suprarenal gland, Liquor Hypophysis, Cannabis, Ergot, etc.

The Chairman compiled a tentative plan of work and submitted the same to the Committee for further criticisms and suggestions.

The tentative plan was changed accordingly, and we are now in position to submit the following plan of work for this Committee:

SUGGESTED PLAN OF WORK ON DIGITALIS.

1. Compare the accuracy and practicability of M. L. D. Frog Heart Method, One Hour Frog Heart Method, Cat Method and Guinea Pig Method for the heart tonics and depressants.

(*a*) A Tincture of Digitalis will be prepared by the Chairman, and samples of this tincture sent to the other members of the committee. The samples will be sufficiently large for further investigations as to deterioration, etc.

(*b*) The M. L. D. of this sample should be estimated by the different members, using Ouabain as a standard which will also be supplied by the Chairman, in order to find out if concordant results can be obtained by the One Hour Method. If the results are satisfactory, the tincture should be diluted according to the results obtained, and

(*c*) To this diluted tincture, the other methods should be applied together with the M. S. S. method.

These experiments will test the accuracy of the method and at the same time convert the standards of the Pharmacopoeia into terms of the M. L. D. Frog Heart and Guinea Pig Method, and thus enable each member to compare the U. S. P. standard with the standards adopted by his laboratory and to state whether in his opinion the U. S. P. standards are O. K. or whether they should be raised or lowered.

2. As a difference of opinion exists as to the proper substance for standardizing animals which are subject to seasonable variation, chemical and pharmacological tests for the identity and purity of both Ouabain and Kombe Strophanthin should be studied with the object of deciding which is the better standard.

3. In order that the methods of standardization and rate of deterioration may be considered at one and the same time, and with minimum labor, a sufficient quantity of Tinctures of Digitalis and Ouabain will be submitted for No. 2 that the tests may be repeated at intervals of 4 months for a period of two years.

(*a*) A summary of the results obtained will be valuable in determining the rate of deterioration of Digitalis preparations and in enabling us to come to a conclusion as to the choice of methods.

Accordingly, the Chairman prepared a lot of Tincture of Digitalis and distributed it together with a sample of Ouabain to each member of the Committee with a request that laboratory work be conducted according to the above outline.

To date, three members of the Committee have assayed the Tincture by the "One Hour Frog Method" and reported as follows:

H. C. Hamilton	102.8%
H. C. Colson	101.5%
P. S. Pittenger	108.3%

You will note, therefore, that there is a variation of only 6.8 percent in the results obtained with the "One Hour Frog Method" by the three different workers.

These results are indeed very satisfactory and encouraging, especially when we consider the fact that non-standardized tinctures of Digitalis vary hundreds of percent in activity.

I would call your particular attention to the above results as only too frequently we hear rather caustic criticisms of the value of biologic assaying, which leave the impression that biologic assay methods are practically valueless because the results obtained by different workers vary from 50 to 100 percent, whereas this report shows a variation of only 6.8 percent in the results obtained by workers in three different laboratories.

These results would indicate, therefore, that if the experiment is properly conducted, very reliable results can be obtained by the "One Hour Frog Method."

The Committee will continue its work according to the above plan during the next year, and hope to be in a position to make some definite recommendations to the Association at its next annual meeting.

Respectfully submitted,

H. C. HAMILTON,
H. C. COLSON, JR.
W. A. PEARSON,
PAUL S. PITTENGER,
Chairman.

REPORT OF COMMITTEE ON U. S. PHARMACOPOEIA, AMERICAN PHARMACEUTICAL ASSOCIATION.*

A number of the members of the committee responded to the call of C. H. LaWall, Chairman of the Committee of Revision, for suggestions and criticisms, which accounts in a measure for a somewhat shorter report. The purpose of this report is to briefly call attention to a number of features which should be considered by the next Pharmacopoeial Convention. Extended discussions do not seem necessary.

THE ALCOHOL PROBLEM.

There probably has not been a single question that has received more consideration in matters pharmacopoeial than alcohol. The present nation-wide movement to limit the use of alcohol to very restricted lines is well recognized and receives the approbation of both the medical and pharmaceutical professions. The present Pharmacopoeial Committee deleted from the last revision of the Pharmacopoeia not only a number of preparations which would lend themselves to beverage purposes, but also such as were beverages in themselves. Even whiskey and brandy were eliminated. In other instances the percentage of alcohol was materially reduced. It is believed the time is now at hand when additional reductions in alcohol content should be made wherever practicable. At a meeting in Washington during the war for considering a restricted use of alcohol it was contended by some that the alcohol content of the present Pharmacopoeial products could not possibly be reduced; others believed some reduction might be effected in some cases. Whatever our personal views may be in these matters there is no question but that existing conditions should, and must, receive very careful consideration and appropriate action. It is not a theory that confronts us but a condition. Every effort should be made to reduce the percentage of alcohol to the amounts necessary for extracting medicinal principles, or keeping the medicaments in solution, or preserving the preparations, etc.

METHODS OF ANALYSES.

It is self-evident that no method of analysis should be included in the Pharmacopoeia which will not give fairly concordant results in the hands of experienced workers. Any other course is liable to lead to complications under existing laws and the trade generally. If a method is used which is liable to material variation and commodities are handled on the basis of the results obtained by such methods, it can readily be seen that not only may manufacturers be penalized and chemists liable to censure but a considerable amount of monetary loss may result. The variations should not exceed the limits prescribed by the present Pharmacopoeia or such limits as may be adopted in a future revision. No method should be considered for possible inclusion which in a try-out varies more than 20 percent in the hands of skilled workers.

ONE MAN METHOD.

In the past it has happened that a method worked out by a single individual has been adopted without giving it thorough consideration. It is not believed that a one-man method should be adopted in a book that has the standing in law the Pharmacopoeia has. Furthermore, it is not believed desirable to adopt any method that has been tried out only in one laboratory. All methods should be carefully and fully tried out by a number of workers before receiving recognition.

CHANGE METHODS AND STANDARDS.

If the present Pharmacopoeia provides a good standard and good methods for determining such a standard they should not be changed unless better ones are at hand. They should never be changed for individual or personal reasons. A frequent changing of methods and standards is an economic loss. They require manufacturers to adjust products on a new basis and the analyst is compelled to spend time and material to become acquainted with the new elements involved. It can readily be seen, therefore, that changes in methods and standards cost time, money and labor, and unless something is to be gained, the loss seems unnecessary.

BIOLOGIC TESTING.

More and still louder criticisms of this form of testing are in evidence. What has been said above in conjunction with methods of analysis, generally, applies to this form of testing

*New York meeting, 1919.

drugs. Every possible effort should be made to establish methods of biologic testing of drugs which will give fairly concordant results in the hands of skilled pharmacologists.

DEFINITIONS TO BE CAREFULLY CHOSEN.

When it is recalled that the various food and drug laws cover everything between the covers of the Pharmacopoeia, it can be readily seen how important it is to carefully formulate definitions. If, for example, a definition for asafoetida prescribes that this drug comes from a given source, this portion of the standard contained in the Pharmacopoeia in and of itself may control the purity of the drug. In the past it has happened that asafoetida was adulterated with resinous material which would provide the amount of alcohol soluble material called for by the Standard but it was clearly established by tests other than those contained in the Pharmacopoeia that the asafoetida was actually adulterated and contained material which was not derived from the plant source called for by the definition in the Pharmacopoeia. Such products based on the definition alone are not asafoetida. Another case that comes to mind is an alleged balsam of Peru which complied with all of the tests prescribed by the U. S. Pharmacopoeia, excepting that defining the source of the commodity.

If the definition should include a geographic source, this, of necessity, if the law is strictly construed, would constitute a part of the standard. It is therefore plainly evident that no geographic name should be used unless it is carefully established that such a term is needed in order to secure the proper quality of drug.

LIMITS OF ASH, STEMS, WORMY AND INFECTED MATERIAL SHOULD BE CAREFULLY PROVIDED.

The present Pharmacopoeia provides ash limits in a goodly number of drugs. Some of these should be carefully revised. The question of limiting the presence of stems and other foreign materials should also receive additional careful consideration. In some instances (belladonna leaves; ipecac root) a larger percentage of stems may be included because such stems contain material amounts of the active ingredients and lessen the expense of the drugs. Wormy material or material contaminated with excrement of vermin, insects, etc., is not specifically covered. These features should also be carefully considered and made parts of the standards. It is perfectly true that when such drugs are powdered or made into the finished preparations the ultimate consumer will not be any the wiser but it is manifestly unfair to take advantage of the consumer because of his ignorance of matters of this character. He should be protected.

LIMIT TESTS.

In the case of chemicals, many limit tests are introduced. Some of the wording of these tests is very obscure, involved and unsatisfactory. For example, in the case of testing for chlorides after setting out a method of procedure we find that the personal equation is liable to enter into the ultimate conclusion very materially. The acceptance or the rejection of a chemical may depend upon such indefinite adjectives as "turbidity," "opalescence," "faint precipitate," etc. One chemist may have formulated in his mind what a "slight turbidity" might mean; another analyst might have an entirely different idea in his makeup. Cases have actually occurred where disputes have arisen regarding the quality of chemicals because of these indefinite elements. It is believed that when such terms are used methods should be provided for determining how to arrive at them so that different chemists working in different laboratories could readily inform themselves as to what the terms actually mean.

ARTICLES TO BE INCLUDED.

This is one of the difficult points to determine upon. The drugs included in the Pharmacopoeia are intended for the use of the medical profession in the treatment of the sick. Physicians or groups of physicians have different conceptions as to the value of various drugs. One is satisfied that a given drug gives excellent results in his practice; another feels equally positive that the drug is of little use. The function of the Pharmacopoeia is not to determine whether or not one physician or a set of physicians is correct. Its primary purpose is to provide standards which will insure that uniform and reliable drugs are placed in the hands of the medical man for the treatment of his patients. It is believed the day will come and is near at hand when the number of drugs used by the medical profession will be materially reduced, but until such time does arrive it is believed that the members of the medical profession should have a large voice in the drugs to be recognized by the Pharmacopoeia.

INTERVAL BETWEEN TIME OF ISSUE AND TIME OF BECOMING EFFECTIVE.

The last decennial revision of the U. S. Pharmacopoeia had hardly reached the hands of druggists, manufacturers and analysts before it became effective. It is clearly evident that such a short interval of time is inadequate for the trade, analysts and others to adjust matters affected by the new publication. The conditions existing at the time the last Pharmacopoeia became effective compelled those in charge of the enforcement of the Food and Drugs laws to take upon themselves the responsibility of not enforcing the standards contained in the book until the trade had had sufficient time to adjust itself to the new conditions. In some cases this required at least a year. It is believed that at least a year should elapse between the time the next edition of the Pharmacopoeia is placed on the market and the time it becomes effective. This would enable the trade and all others affected to adjust themselves to the new standards. They would then not be entitled to the excuse so often met with that the new book had been thrust upon them so suddenly that they had not been able to adjust themselves to the new standards and requirements. It is believed that such a course as the one outlined above would be fair and just, not only to the trade, but also to the chemists, the physicians and the consumer.

DO MOST OF WORK BEFORE NEXT CONVENTION.

It is believed to be a mistake to practically discontinue activities after the book has been made available. It is believed the work should be as aggressive between the time the new edition appears and the time for the next Pharmacopoeial Convention as any other time in the revision of the publication. If such a course were adopted the Committee would be prepared, to a large extent, to place it in the hands of the newly-appointed organization to proceed on definite plans and lines based on the results provided by the work of the former Committee. It is believed that such a course would materially reduce the length of time now necessary to issue a new edition.

PAY FOR WORK AS FAR AS POSSIBLE.

This feature is considered not with the idea of criticizing the excellent work done in past years voluntarily, but with a view of calling attention to the fact that it is asking too much of many of the busy men to give up a large amount of time to the work and receive no compensation therefor. Some can afford the time and labor only at the expense of health. In many instances the workers would not accept remuneration under any circumstance, but they often can ill afford to give the time for it. It is, therefore, believed that the best way to solve this problem is to employ suitably paid workers and exact from them due returns for the compensation revision.

IMITATIONS AND SUBSTITUTES.

Proprietary preparations through advertising and merit at times gain for themselves a useful place as remedial agents. In some instances an effort has been made to introduce into the Pharmacopoeia what might be called an imitation or a substitute. It is believed that if a manufacturer or dealer through investigation, expenditure of money and time produces a product which is of value to the public and especially the sick he is entitled to some consideration both morally and legally. After a given time it should become public property. In no case should the Pharmacopoeial Committee introduce into the Pharmacopoeia what might be looked on as a substitute or an imitation for such product. Attention at this point is called to the fact that the Food and Drugs Act forbids the placing on the market of imitation drugs.

SCIENTIFIC LITERARY EDITOR.

The wording of the methods of analyses, the limit tests and standards are sometimes obscure, indefinite or susceptible of more than one construction. All this should be rectified. It is believed that a large part of these shortcomings can be eliminated by having everything carefully edited, keeping in mind particularly brevity, clarity and definiteness.

NOMENCLATURE.

All names should be carefully chosen so as to avoid confusion and mistakes. Ferric Phosphate means a definite chemical but this name in the Pharmacopoeia refers to a mixture of iron phosphate and sodium citrate. In short, everything introduced into the Pharmacopoeia should be made as definite and specific as possible.

Respectfully submitted,

L. F. KEBLER, *Chairman*

PROCEEDINGS OF THE LOCAL BRANCHES

"All papers presented to the Association and its branches shall become the property of the Association, with the understanding that they are not to be published in any other publication than those of the Association, except by consent of the Committee on Publication."—By-Laws, Chapter X, Art. III.

Reports of the meetings of the Local Branches should be mailed to the Editor on the day following the meeting, if possible. Minutes should be typewritten, with wide spaces between the lines. Care should be taken to give proper names correctly, and manuscript should be signed by the reporter.

CHICAGO.

The one hundred and fourth monthly meeting of the Chicago Branch American Pharmaceutical Association was held at the LaSalle Hotel, Friday evening, October 24, 1919, at eight o'clock. The meeting was preceded by a dinner, which was well attended.

The first speaker of the evening, Julius H. Riemenschneider, presented a pleasing review of the Rochester meeting of the National Association of Retail Druggists. He said that 1000 delegates and visitors were registered at the meeting, that the druggists of Rochester entertained lavishly in their beautiful city, and that the business meetings were well attended and very profitable.

Splendid talks were given by C. A. Mayo on the Edmonds' Bill, Attorney Brokmeyer on the absolutely essential need of publicity, and Wayne B. Wheeler, Attorney for the Anti-Saloon League, on the sale of intoxicants by the druggist. The Association adopted a resolution urging druggists to discontinue entirely the sale of liquors, even on prescriptions. Very recently, Mr. Riemenschneider said, word has come from the Government that druggists will be permitted to sell preparations containing alcohol of *strictly U. S. P. and N. F. Standard*, but right here is where the Government will "get" the unscrupulous among pharmacists. Mr. H. P. Hynson, of Baltimore, was a strong advocate for the A. Ph. A., and a resolution on closer coöperation between the N. A. R. D. and A. Ph. A. was enthusiastically adopted.

Professor C. M. Snow presented most admirably the "doings" of the A. Ph. A. meeting at New York. His praise of Local Secretary Schaefer and his committee was endorsed by all present who had been at the New York meeting. In Professor Snow's review he mentioned especially that for the first time in years all three of the nominees for the next president are retail druggists, Charles H. Packard of Boston, Fred. W. Nitardy, now of Brooklyn, and L. A. Seltzer of Detroit.

W. B. Day, Secretary of the Illinois Pharmaceutical Association, reported the June meeting of this Association. Over 500 were registered and the business sessions were well attended. Illinois now boasts the largest membership, 1600, among the state pharmaceutical associations, especially those with voluntary membership. New members this year totalled 400. The President's address was excellent, and Secretary Samuel C. Henry of the N. A. R. D. gave an able address on the narcotic situation. A resolution against liquor selling was adopted.

The question of publishing extracts of pharmaceutical literature in up-to-date monthly form, which was raised by the chairman of the Scientific Section at the recent New York meeting and which received much discussion before the Council of the Association, has now been brought to the attention of the Local Branches by the recent action of the New York Branch, as follows:

"BE IT THEREFORE *Resolved*, that the New York Branch of the American Pharmaceutical Association respectfully urge upon the Executive Committee and the Council a speedy submission of the problem to the entire membership of the Association in the shape of a special post-card referendum, said post-card ballot to give to each member the opportunity to vote on one of the following options:

(*a*) Raising A. Ph. A. dues to $7.50 a year and instituting a monthly abstract journal to replace the present Year Book.

(*b*) Raise A. Ph. A. dues to $6.00 a year and continue the present Year Book.

(*c*) Keep the A. Ph. A. dues at $5.00 a year and abolish the Year Book.

(*d*) Keep the A. Ph. A. dues at $5.00 a year, abolish the JOURNAL as well as the Year Book, and publish bound copies of the combined Proceedings and Progress of Pharmacy, same as prior to 1912.

After full discussion before the Chicago Branch the following motions were adopted:

1. A referendum vote should be taken from the members of the A. Ph. A. on the question of publication of pharmaceutical literature in a monthly abstract journal or in an annual volume.

2. The options or questions to be placed on the referendum ballot as suggested by the New York Branch are not approved, for they are too complicated and could not result in a decisive vote.

3. The referendum should consist of but two questions only:

(*a*) Do you favor our Association publishing abstracts of pharmaceutical literature in monthly form in an abstract journal? or

(*b*) Do you favor our Association publishing abstracts of pharmaceutical literature in annual form as is now being done in the Year Book?

The list of the arguments advanced in favor of these motions was as follows:

(*a*) As long as the question is up and there seems to be a real difference of opinion among a considerable portion of the membership, it should be settled, preferably by ballot.

(*b*) The question of increasing the dues of the Association is entirely foreign to the question of how the abstracts shall be published. If the cost of publishing an abstract journal increases the expense of the Association, let that be an argument in favor of the Year Book, and if the advocates of such a journal can demonstrate that the cost would not exceed or be less than the present cost of the Year Book, so much more an argument in their favor. If the need of increasing the dues of the Association is considered imperative by the Executive Committee of the Council, then the dues must be increased and a referendum thereon is useless. In any event, the By-Laws must be amended before the dues can be increased and such amendment can only be made at the annual meeting.

(*c*) To be effective a referendum should contain no more than a pro and con of one question, that can be answered "Yes" or "No" without qualification of any kind. A referendum such as proposed by the New York Branch with four diverse questions and two great policies to be considered could not be decisive; furthermore, there should be no idea presented in the referendum of discontinuing any of the present service features of the Association unless something better take the place of the discontinued feature.

E. N. GATHERCOAL, *Secretary.*

DETROIT.

The first meeting of the 1919–'20 season of the Detroit Branch A. Ph. A. was called to order at 8.30 P.M. October 17, by President E. R. Jones.

The minutes of the preceding meeting were read and approved.

The President then called Vice-President W. H. Brome to the chair while he read an address, presenting three resolutions, which was attentively received.

The first resolution: That hereafter our meetings commence at 8.15 P.M. to be followed by a buffet lunch in the judgment of the officers, except where the particular case demands a dinner at 6.30 precede. Supported. Carried.

The second recommendation: That the Branch get behind Mr. Seltzer's candidacy for the Presidency of the A. Ph. A. was amended by asking the Secretary to write each member of the A. Ph. A. in Michigan, urging Mr. Seltzer's election. Supported. Carried.

The third recommendation: That the Branch endeavor to get a prerequisite law passed by the next legislature, was amended by adding that a committee be appointed, consisting of President, Secretary and Chairman of Program Committee, to undertake the necessary work in conjunction with a similar committee from the D. R. D. A. to consider the appointment of the committee to do the work. Carried.

Mr. Chase made an appeal for ideas on topics that would be interesting to the Branch, and spoke regarding the World War Veterans Branch of the A. Ph. A. and the free membership accorded veterans of the war for one year.

Mr. Chase presented a motion that the meeting date be changed to the second Friday of every month. This motion is tabled until our next meeting according to our By-Laws.

Mr. Seltzer moved that our November meeting be held on the second Friday. Carried.

Mr. O. A. Farwell was then introduced, who read a paper on "A New Preservation for Biological Specimens." A saturated solution of chloretone, being the new vehicle employed, has proved to be most satisfactory and equal in all respects to alcohol.

The President then introduced Dr. Byington of the State Public Health Service, who spoke on the new Michigan Venereal Disease Law. He explained the purpose and the workings of the law quite clearly. An interesting discussion then followed.

Mr. Webster suggested that the druggists be supplied with instructive literature to give to those who ask for venereal remedies.

F. F. INGRAM, JR., *Secretary.*

NEW YORK.

The October, 1919 meeting of the New York Branch of the American Pharmaceutical Association was called to order in the lecture hall of the New York College of Pharmacy Building, on Monday evening, October 13th, at 8.15 P.M.

Thirty-five members were present.

Minutes of the preceding meeting were read and approved.

Member of the Council.—Prof. Jeannot Hostmann brought in no report.

Fraternal Relations.—Dr. Leon Lascoff brought in no report.

Audit Committee.—Dr. Jacob Diner reported all bills paid.

Education and Legislation.—Mr. E. J. Kennedy brought in no report.

Communications.—A letter was read from Mr. Sigmund Kopald regarding the proposed revision of Schedule C. of the Pharmacy Law. This letter was ordered filed. A letter was read from Mr. Louis Berger, Secretary of the New York Pharmaceutical Conference, requesting our delegates to the Conference to be instructed as to what action should be taken with regard to the demands of the drug clerks. After some discussion it was moved, seconded and carried that since the Local Branch is not a representative body of pharmacists the Branch delegates to the Conference shall not take any definite stand regarding the clerk question and that Mr. Berger be so informed by the Secretary. A letter was read from Chairman Robert P. Fischelis of the War Veterans Section of the A. Ph. A. requesting that action should be taken to get as many war veterans as possible into the new Section of the A. Ph. A. It was moved, seconded and carried that the Secretary of the Branch be instructed to send applications to each and every member of the Branch with the notice of the next meeting.

NEW BUSINESS.

After a discussion of the action taken by the Council with regard to the Year Book, raising of dues, etc., the following resolutions were adopted:

WHEREAS, The question of the fate of the Year Book brought up at the New York meeting of the American Pharmaceutical Association, through the proposition to convert it into a monthly abstract journal, has developed into several propositions including one to abolish it altogether, and

WHEREAS, This question will never be satisfactorily settled until a clear-cut referendum be had including all propositions and arranged to bring the largest possible response from our membership, and

WHEREAS, Efforts in this direction made at the meeting of the A. Ph. A. Council held on August 29th have been postponed by reference of the problem to the newly created Executive Committee;

Be It Therefore Resolved, That the New York Branch of the American Pharmaceutical Association respectfully urge upon the Executive Committee and the Council a speedy submission of the problem to the entire membership of the Association in the shape of a special post-card referendum, said post-card ballot to give to each member the opportunity to vote on one of the following options:

(*a*) Raising A. Ph. A. dues to $7.50 a year and instituting a monthly abstract journal to replace the present Year Book.

(*b*) Raise A. Ph. A. dues to $6.00 a year and to continue present Year Book.

(*c*) Keep the A. Ph. A. dues at $5.00 a year and abolish the Year Book.

(*d*) Keep the A. Ph. A. dues at $5.00 a year, abolish the JOURNAL as well as the Year Book, and publish bound copies of combined Proceedings and Progress of Pharmacy, same as prior to 1912.

And Be It Further Resolved, That copies of these resolutions be sent the Secretary of the A. Ph. A., the Secretary of the Council of the A. Ph. A. and the Secretary of each Local Branch of the A. Ph. A.

The second half of the meeting was devoted to the reading of a paper on Commercial Health Insurance by Dr. J. J. O'Reilly. This paper was followed by considerable discussion at the conclusion of which it was moved, seconded and carried that a committee be appointed to attend the joint meeting of the New York Medical and Pharmaceutical organizations to be held on October 16th at the Chemists' Club. The committee appointed consisted of Dr. Geo. Hohman, Mr. Robert S. Lehman, Dr. Joseph L. Mayer.

After considerable discussion a vote of thanks was tendered the speaker.

Under regular procedure the meeting was declared adjourned.

HUGO H. SCHAEFER, *Secretary.*

PHILADELPHIA.

The October meeting of the Philadelphia Branch of the American Pharmaceutical Association was held Tuesday evening, October 14, 1919 at the Philadelphia College of Pharmacy.

Being the first meeting of the 1919–1920 season the business matters consisted largely of discussion of plans for well attended, interesting and enthusiastic meetings for this season. A number of very helpful suggestions were made and it was agreed that the meetings shall be held always the second Tuesday of each month at 8 P.M. in the Philadelphia College of Pharmacy.

The Membership Committee submitted a report that an intensive membership campaign had been started with members of the parent body who were not members of the Branch.

The World War Veterans Section was discussed at length and the local branch agreed that all pharmacists entitled to membership in the parent body under the special arrangements in force would also be members of the local branch without charge for the first year's dues.

The President appointed Josiah C. Peacock, W. L. Cliffe and E. G. Eberle a committee to draft and forward to Mrs. Frank M. Apple resolutions of sympathy on account of the death of Mr. Apple, a long time and faithful member of the Local Branch.

The entertainment of the evening consisted of very able reports of the various conventions held this summer, as follows:

The American Pharmaceutical Association, by E. G. Eberle.

The National Association of Retail Druggists, by Ambrose Hunsberger.

The Pennsylvania Pharmaceutical Association, by Prof. Julius Sturmer.

The Pennsylvania State Medical Association, by F. E. Stewart.

The evening's program was concluded with refreshments served by a local caterer.

ELMER H. HESSLER, *Secretary.*

ST. LOUIS.

The monthly meeting of the St. Louis Branch was held at the St. Louis College of Pharmacy, Thursday, September 18th.

Major F. L. McCartney, a pharmacist in charge of purchasing medical supplies, during the war, delivered the address of the evening. Major McCartney, who is connected with the New York Branch of the Association, gave in detail the methods used by the Government in supplying the enormous demand for medical and surgical supplies during the big drive in Europe. All bids and awards were made publicly, which prevented any possibility of one firm being favored in preference to another. In a great many instances, especially during the early months of his appointment, price was a secondary factor, whereas time of delivery was considered first.

Although the demand was exceedingly large, the Government experienced little trouble due to shortage. This Major McCartney attributed to the hearty coöperation of the manufacturing pharmacists and the retail druggists economizing on the supplies needed by the Government. The shortages of medical supplies experienced by the various camps was due, in a majority of cases, to delay in ordering and misjudging the amount of supplies needed for a certain period.

A rigid watch was kept on the quality of drugs offered, and those that did not answer the requirement were rejected, and suggestions offered to remedy the error in the method of manufacture. Major McCartney concluded by answering many questions asked by the members.

Dr. H. M. Whelpley told many interesting details about the meeting in New York and the pleasure experienced through personal contact with his many friends and associates there. Dr. Whelpley attributes the life and success of the Association to the cordiality and friendship among the members as well as to the interest in pharmaceutical affairs.

Mr. J. M. Noble gave a report on the Scientific Section in which most of his time was spent while attending the New York meeting. He incidentally remarked that the number of young men at the convention was an agreeable surprise.

Vice-President St. John officiated in the absence of President Berg, who last month accepted a position with Burrough Brothers in Baltimore.

One application for membership was reported to have been turned over to the Treasurer. Leslie Prichard was appointed to succeed President Berg as Chairman of the Membership Committee. Before adjournment, October 16th was selected for the next meeting.

LESLIE E. PRICHARD, *Secretary.*

COUNCIL BUSINESS

MINUTES OF THE THIRD SESSION OF THE COUNCIL, 1918–1919.

The third session of the Council of the American Pharmaceutical Association for 1918–19 was held at the Hotel Pennsylvania, New York, on Wednesday, August 27, 1919, the meeting being called to order at 8 P.M. by Vice-Chairman S. L. Hilton, who presided.

Present: Messrs. H. V. Arny, James H. Beal, George M. Beringer, Wm. B. Day, Alfred R. L. Dohme, Clair A. Dye, E. G. Eberle, F. R. Eldred, J. W. England, E. N. Gathercoal, J. G. Godding, S. L. Hilton, Wortley F. Rudd, Clyde M. Snow, Dr. F. E. Stewart, R. W. Terry, Dr. H. M. Whelpley, J. A. Koch and C. H. LaWall.

On motion, the reading of the minutes of the previous sessions was dispensed with.

Applications for membership from 521 to 572 inclusive were presented and favorably acted upon. The list was:

No. 521. John Mueller, Cor. 25th and Holmes St., Kansas City, Mo., rec. by Jacob Diner and G. Horstmann.

No. 522. Uriel Russin, 1764 Weeks Ave., New York, N. Y., rec by G. Horstmann and Jacob Diner.

No. 523. Charles Lincoln Gately, 1002 Candler Bldg., Atlanta, Ga., rec. by G. Horstmann and Jacob Diner.

No. 524. Mrs. Fannie Lamar Rankin Gately, 960 Peachtree St., Altanta, Ga., rec. by Jacob Diner and G. Horstmann.

No. 525. Stephen Oscar Blair, Monroe, N. C., rec. by H. M. Whelpley and J. W. England.

No. 526. John William Dysle, 128 Front St., Marietta, Ohio, rec. by Frank H. Freericks and Wm. B. Day.

No. 527. Wm. L. Huning, c/o Monsanto Chemical Works, 12 Platt St., New York, N. Y., rec. by F. L. McCartney and Charles E. Caspari.

No. 528. Walter S. Goff, c/o Monsanto Chemical Works, 12 Platt St., New York, N. Y., rec. by F. L. McCartney and Chas. E. Caspari.

No. 529. A. C. Robertson, c/o Monsanto Chemical Works, 12 Platt St., New York, N. Y., rec. by F. L. McCartney and Chas. E. Caspari.

No. 530. James Edgar Shepherd, 12 Audrey Ave., Oyster Bay, N. Y., rec. by G. Horstmann and Jacob Diner.

No. 531. Jacob J. Franz, 184 E. 125th St., New York, N. Y., rec. by G. Horstmann and Jacob Diner.

No. 532. Carl Clark Gray, 22 Highland Ave., Houlton, Me., rec. by Wm. B. Day and J. J. Bradley.

No. 533. William Dulany Ogletree, Troupe, Texas, rec. by R. H. Walker and Wm. B. Day.

No. 534. Ole P. Ronning, Main St., Waubay, So. Dakota, rec. by D. P. Jones and A. A. Zieske.

No. 535. Thomas A. Findlay, Westhope, N. D., rec. by W. P. Porterfield and E. L. Newcomb.

No. 536. Carl McDonald Thompson, Tower City, N. D., rec. by W. P. Porterfield and E. L. Newcomb.

No. 537. Andrew Martin Reite, Portal, N. D., rec. by W. P. Porterfield and E. L. Newcomb.

No. 538. Sister M. Conchessa, St. John's Hospital, Fargo, N. D., rec. by Oscar Hallenberg and W. P. Porterfield.

No. 539. George James McCabe, Nekoma, N. D., rec. by W. P. Porterfield and E. L. Newcomb.

No. 540. Ziba Fred. Hamilton, Hunter, N. D., rec. by E. L. Newcomb and J. W. England.

No. 541. Paul Bilden, Northwood, N. D., rec. by E. L. Newcomb and J. W. England.

No. 542. Peter O. Bugge, Bisbee, N. D., rec. by W. P. Porterfield and E. L. Newcomb.

No. 543. Joseph A. Belanger, York, N. D., rec. by W. P. Porterfield and E. L. Newcomb.

No. 544. Thomas Spencer Harris, Hettinger, N. D., rec. by W. P. Porterfield and E. L. Newcomb.

No. 545. Georg · Lockett, Wimbledon, N. D., rec. by W. P. Porterfield and E. L. Newcomb.

No. 546. Herbert E. White, Jamestown, N. D., rec. by W. P. Porterfield and E. L. Newcomb.

No. 547. Samuel N. Rinde, Lankin, N. D., rec. by W. P. Porterfield and E. L. Newcomb.

No. 548. William Arthur Roehm, Garrison, N. D., rec. by W. P. Porterfield and E. L. Newcomb.

No. 549. John J. Keen, 506 Dok Ave., Wahpeton, N. D., rec. by E. L. Newcomb and J. W. England.

No. 550. John C. Macphail, Buffalo, N. D., rec. by Oscar Hallenberg and W. P. Porterfield.
No. 551. S. C. Hoel, Milnor, N. D., rec. by Oscar Hallenberg and W. P. Porterfield.
No. 552. Hjalmar C. Hendrickson, Luverne, N. D., rec. by Oscar Hallenberg and W. P. Porterfield.
No. 553. Oscar Zuercher, Kenmare, N. D., rec. by W. P. Porterfield and E. L. Newcomb.
No. 554. Henry B. Smith, 536 Fifth Ave., Brooklyn, N. Y., rec. by J. Leon Lascoff and Geo. C. Diekman.
No. 555. Ernest Friedhoff, 63 Fort Green Pl., Brooklyn, N. Y., rec. by C. F. Fischer and J. Leon Lascoff.
No. 556. Charles H. Van Buren, Third Ave. and 18th St., New York, N. Y, rec. by C. F. Fischer and G. Horstmann.
No. 557. Walter Weld Figgis, 46 Barclay St., New York, N. Y., rec. by Hugo Kantrowitz and Robt. Lehman.
No. 558. Howard F. Brownell, 1152—55th St., Brooklyn, N. Y., rec. by F. W. Nitardy and C. DeJonge.
No. 559. William E. Fay, Flushing, N. Y., rec. by F. W. Nitardy and C. DeJonge.
No. 560. Ray E. Schoetzow, 82 Montague St., Brooklyn, N. Y., rec. by F. W. Nitardy and Wm. B. Day.
No. 561. Harry R. Cary, 19 Woodruff Ave., Brooklyn, N. Y., rec. by F. W. Nitardy and Wm. B. Day.
No. 562. Adolph Schmidt, 267—4th St., Hoboken, N. J., rec. by Jeannot Hostmann and Wm. B. Day.
No. 563. Henry Buch, 661 Columbus Ave., New York, N. Y., rec. by Robt. Lehman and Hugo Kantrowitz.
No. 564. Selma V. Temliak, 1503 Madison Ave., New York, N. Y., rec. by H. V. Arny and Wm. B. Day.
No. 565. Herman Reaske, 498 Second Ave., New York, N. Y., rec. by Jeannot Hostmann and Wm. B. Day.
No. 566. Charles H. Schmidt, 320 Washington St., Hoboken, N. J., rec. by Jeannot Hostmann and Wm. B. Day.
No. 567. Charles Tuffiash, 59 South Muner Ave., Newark, N. J., rec. by E. N. Steine and Jeannot Hostmann.
No. 568. Walter Andrew Blaesser, Paullina, Iowa, rec. by Wilber J. Teeters and G. Horstmann.
No. 569. Albert Koehler, 188 St. Nicholas Ave., New York, N. Y.. rec. by J. Leon Lascoff and Geo. E. Schweinfurth.
No. 570. Frank W. McIntosh, Farmville, Va., rec. by W. F. Rudd and A. Bolenbaugh.
No. 571. George Bliss Upham, Walker, Minn., rec. by E. L. Newcomb and J. W. England.
No. 572. William T. Kerfoot, 7th and L Sts., N. W., Washington, D. C., rec. by E. G. Eberle and J. W. England.

Applications for the membership of 139 soldier, sailor and marine pharmacists (under Motion No. 30 of Council Letter No. 23) were presented, as follows:

S. S. No. 1. Conwell Forinan Dirickson, 27th and Chestnut Ave., Newport News, Va., Sgt. first class, Charge Dispensary Base Hospital, Camp Lee, Va., discharged March, 18, 1919, rec. by Frank H. Freericks and J. W. England.
S. S. No. 2. Henry Mark Wiley, 905 Washington Blvd., Beaumont, Texas, Inf. Co. K., 360 Inf., 90th Div., discharged June 21, 1919, rec. by W. C. Wiley and J. W. England.
S. S. No. 3. Harley G. Davenport, Chewelah, Wash., 364 F. H. Co., 316 San. Tr., 91st Div., discharged May 10, 1919, rec. by E. G. Eberle and J. W. England.
S. S. No. 4. Edgar Morgan Baker, 627 11th Street, Huntington, W. Va., Medical Dept., B. H. No. 69, U. S. A., discharged July 23, 1919, rec. by Frank H. Freericks and J. W. England.
S. S. No. 5. Robert F. Fuelleman, 1302 Eastern Ave., Janesville, Wisc., Medical Department, Lavanna Pro. Grd., Ill., discharged June 23, 1919, rec. by W. M. Pfenning and J. W. England.

S. S. No. 6. Harold L. Ernest, General Hospital 43, National Soldiers Home, Va., Medical Department, Hospital Sgt., still in the service, rec. by D. M. Roberts and J. W. England.

S. S. No. 7. Calvin Frank Pate, Huntsville, Texas, Medical Department, unassigned, discharged December 6, 1918, rec. by Frank H. Freericks and J. W. England.

S. S. No. 8. Max Colton, 63 Peshine Ave., Newark, N. J., Medical Detachment, 7th American Train, discharged July 24, 1919, rec. by S. A. Kamper and S. Katchers.

S. S. No. 9. William H. Grebe, Brenham, Texas, Medical Department U. S. Army, General Hospital 32, discharged February 13, 1919, rec. by Frank H. Freericks and J. W. England.

S. S. No. 10. Charles Bryan Allison, Farmersville, Texas, Hospital Corps of the Navy, still in the service, rec. by Chas. H. Owen and Frank H. Freericks.

S. S. No. 11. Thomas George Barnes, Bellville, Texas, 111 Ammunition Train, discharged April 1, 1919, rec. by A. E. Carter and Frank H. Freericks.

S. S. No. 12. Malcolm Graham Frazier, Watertown, Tenn., U. S. Navy, discharged June 12, 1919, rec. by Frank H. Freericks and J. W. England.

S. S. No. 13. Lester E. Webber, 14 Rand St., Central Falls, R. I., 7th Sanitary Train, discharged July 9, 1919, rec. by Frank H. Freericks and J. W. England.

S. S. No. 14. David Botteter Peters, Navy Recruiting Station, Arcade Building, Columbia, S. C., Surgeon (Assist.) Navy, rec. by Frank H. Freericks and J. W. England.

S. S. No. 15. Edward B. Knight, Bamberg, S. C., Co. K, 318th Inf., 80th Div., discharged June 5, 1919, employed by Mack's Drug Store, Bamberg, S. C., rec. by F. B. McCrackin and J. W. England.

S. S. No. 16. Triz. Van. Cockfield, Johnsonville, S. C., Navy Medical Branch, still in service, rec. by B. H. Carroll and J. W. England.

S. S. No. 17. Francis Souter Blair, Chesterfield, S. C., Medical Department, Evacuation Hospital No. 8, discharged June 20, 1919, rec. by Frank H. Freericks and B. L. Gathings.

S. S. No. 18. James Frank Agnew, Spartanburg, S. C., Main and Church Sts., Medical Department attached Dev. Branch No. 2, Camp Wadsworth, S. C., discharged, December 14, 1918, rec. by Lt. R. H. Brice and J. W. England.

S. S. No. 19. James T. Troxell, 621 Main St., Gallitzin, Pa., Medical Department, discharged July 31, 1919, rec. by John E. Reed and J. W. England.

S. S. No. 20. Paul LeBaron Springer, 118 S. Front St., Sunbury, Pa., Motor Field Hospital 44, discharged August 7, 1919, rec. by H. V. Crawford and Frank H. Freericks.

S. S. No. 21. George Leo Smith, 516 Jones St., Hollidaysburg, Pa., Medical Department, 125th Inf., discharged May 29, 1919, rec. by John P. Jacobs and H. I. Davis.

S. S. No. 22. Henry Sage Ostrander, 1319 13th St., Altoona, Pa., Medical Department, discharged July 5, 1919, rec. by Frank H. Freericks and J. W. England.

S. S. No. 23. John James O'Donnell, 1225 Creedmoore Ave., Pittsburgh, Pa., Priv. Medical Corps, 320th Inf., 80th Div., discharged June 7, 1919, rec. by Frank H. Freericks and J. W. England.

S. S. No. 24. Mathew Clarence Meagher, 362 Main St., Slatington, Pa., Medical Department, Columbus Barracks, O., discharged April 14, 1919, rec. by David F. Bentley and Frank H. Freericks.

S. S. No. 25. Michael Joseph Leshinsky, 333 Vine St., Old Forge, Pa., Medical Department, C. A. C., Fort Dupont, Del., discharged soon, rec. by Frank H. Freericks and J. W. England.

S. S. No. 26. Elwood J. Kern, 742 N. 6th St., Allentown, Pa., Quartermaster Corps, U. S. A., discharged May 27, 1919, rec. by Frank H. Freericks and J. W. England.

S. S. No. 27. Harry Hamilton Johnson, 3124 Haverford Ave., Philadelphia, Pa., Medical Corps Hospital, discharged Feb. 22, 1919, rec. by Frank H. Freericks and J. W. England.

S. S. No. 28. Abraham Davidson, 1718 S. 7th St., Philadelphia, Pa., Co. A., 316th Infantry, 79th Division, discharged in February, rec. by B. Steiner and E. J. Lupin.

S. S. No. 29. Edward D. Bruce, c/o Winand's Pharmacy, 6th and Main Sts., Darby, Pa., Medical Department, 310th Engineers, North Russia, discharged July 24, 1919, rec. by Frank H. Freericks and J. W. England.

S. S. No. 30. Frank Neal Britcher, 211 Locust St., Hanover, Pa., Medical Detachment, Base Hospital, Camp Lee, discharged July 3, 1919, rec. by F. L. Ziegler and Frank H. Freericks.

S. S. No. 31. Clifton Ernest Bell, U. S. Louisiana, League Island Navy Yard, Philadelphia, Pa., Hospital Corps, U. S. Navy, still in service, rec. by Worton W. Baker and A. Jay White.

S. S. No. 32. Earl W. Stephens, Hastings, Okla., Field Hospital No. 141, 111 Sanitary Tr., discharged June 19, 1919, rec. by Abe Levite and Carl R. Welden.

S. S. No. 33. George Bernard Sahm, Main St., Okeene, Okla., Co. C., 19th Infantry and Medical Department, Base Hospital, discharged January 11, 1919, rec. by B. C. Sahm and Frank H. Freericks.

S. S. No. 34. Eugene John Wierster, 1407 6th St., Portsmouth, O., Medical Corps, 335 Field Hospital, discharged May 6, 1919, rec. by J. Geo. Wurster and Frank H. Freericks.

S. S. No. 35. Maurice William Sheehy, 1033 Chapel Road, Dayton, O., Air Service, 2nd Mobile Group. discharged February 7, 1919, rec. by J. F. Gallagher and R. Hall.

S. S. No. 36. Mark Allen Kidd, 125 S. Main St., Dayton, O., Debarkation Hospital No. 5, discharged May 29, 1919, rec. by J. F. Gallagher and Frank H. Freericks.

S. S. No. 37. Forrest Lee Glenn, 114 Courtland St., Painesville, O., U. S. Navy, Medical Corps, discharged July 10, 1919, rec. by Frank H. Freericks and J. W. England.

S. S. No. 38. Robert Raymond Fitzpatrick, 908 Sunset Ave., Cincinnati, O., Medical Detachment, B. H. Camp, Sherman, O., still in service, rec. by Frank H. Freericks and J. W. England.

S. S. No. 39. Thomas Leroy McBride, P. O. Box 135, Marshville, N. C., 321st Inf., 81st Div., discharged June 27th at Camp Lee, Va., rec. by B. C. Griffin and H. C. Ashcraft.

S. S. No. 40. Guy Elliott Brookshire, 126 Montana Ave., W. Asheville, N. C., Medical Evacuation Hospital No. 14, discharged May 15, 1919, rec. by R. S. Finley and W. B. Wilson.

S. S. No. 41. Frederick A. Weiss, 2408 Silver St., Brooklyn, N. Y., Q. M. Corps, Instructor, O. T. S., Camp Johnston, Fla., Asst. Supply Officer, 151st Depot Brigade, Camp Devens, Mass., discharged July 28, 1919, rec. by Frank H. Freericks and J. W. England.

S. S. No. 42. Perry Hibbard Wedge, 29 Lake St., Owego, Tioga Co., N. Y., 310th Inf., 78th Division, discharged June 6, 1919, rec. by W. C. Gallagher and Frank T. Ogden.

S. S. No. 43. Alexander Platowsky, 68 Graham Ave., Brooklyn, N. Y., Medical Dept., U. S. G. H. No. 1, Bronx, discharged June 27, 1919, rec. by Frank H. Freericks and J. W. England.

S. S. No. 44. Fred Ortenberg, 794 6th Ave., New York, N. Y., Medical Corps, Governor's Island, discharged March 25, 1919, rec. by Frank H. Freericks and J. W. England.

S. S. No. 45. Joseph Futterman, 44 W. 66th St., New York, N. Y., Medical Corps, discharged April 26, 1919, rec. by David Barker and Louis Barker.

S. S. No. 46. Isidore Fisher, 601 W. 178th St., New York, N. Y., Medical Dept., 407th Telegraph Br., discharged May 12, 1919, rec. by Frank H. Freericks and J. W. England.

S. S. No. 47. Joseph C. Fagan, U. S. Naval Medical Supply Depot, Pearl and Sands Sts., Brooklyn, N. Y., rec. by Frank H. Freericks and J. W. England.

S. S. No. 48. Louis Wilbur Zucker, 126 Washington St., Hoboken, N. J., 76th Field Artillery, Medical Corps, discharged June 21, 1919, rec. by David L. Abrams and B. F. Zuckner.

S. S. No. 49. Oscar K. Whipple, Jr., 65 Broad St., Bridgeton, N. J., Medical Department, 104 Engineers, discharged May 29, 1919, rec. by O. K. Whipple and Henry A. Jordan.

S. S. No. 50. Ira Isaac Schwartz, 887 Broad St., Newark, N. J., Navy, Columbia Naval Unit, U. S. N. R. F., discharged December 20, 1918, rec. by Frank H. Freericks and J. W. England.

S. S. No. 51. Michael Vincent McFadden, 305 Broadway, Camden, N. J., Navy Base Hospital, Unit No. 5, expect discharge September 1, rec. by Frank H. Freericks and J. W. England.

S. S. No. 52. Oscar Samuel Katz, 148 Spruce St., Newark, N. J., Co. E, N. Y. U. S. A. T. C., discharged December 19, 1918, rec. by Frank H. Freericks and J. W. England.

S. S. No. 53. Frank Joseph Dassing, 334 S. 12th St., Newark, N. J., Hospital Corps, U. S. N., still in service, rec. by Frank H. Freericks and J. W. England.

S. S. No. 54. Paul Styer Cutter, 40 E. Federal St., Burlington, N. J. Medical Supply Depot, Army, discharged, April 29, 1919, rec. by Edgar R. Sparks and Frank H. Freericks.

S. S. No. 55. Lewis Wellington LeDuke, Jr., 344 E. High St., Manchester, N. H., Medical Dept., U. S. A., discharged August 9, 1919, rec. by Frank H. Freericks and J. W. England.

S. S. No. 56. LeRoy Earl Whitford, Smithfield, Neb., Infantry 89th Division, discharged June 3, 1919, rec. by Frank H. Freericks and J. W. England.

S. S. No. 57. Waldo Wm. Stevenson, Broken Bow, Neb., Base Hospital No. 49, Medical Department, discharged June 19, 1919, rec. by H. Porter and A. H. Souders.

S. S. No. 58. Ervin J. Haeberle, 1003 9th Ave., Broken Bow, Neb., 3rd Bn., Co. N, Chem. War Service, discharged December 30, 1918, rec. by Frank H. Freericks and J. W. England.

S. S. No. 59. Roy Whitehurst, 3605 Montgall Ave., Kansas City, Mo., rec. by E. W. Larkin and L. Rowe, U. S. Navy Hospital Corps, discharged August 14, 1919.

S. S. No. 60. William Fred True, Henning, Minn., U. S. Navy, U. S. S. Powhatan, discharged July 2, 1919 as Pharmacist Mate, 3rd Class, rec. by Frank H. Freericks and J. W. England.

S. S. No. 61. Tom A. Masucci, 518 Holmes St., Kansas City, Mo., Medical Corps, discharged July 22, 1919, rec. by L. Laureng and Louis Freworth.

S. S. No. 62. Alvin V. Bartelsmeyer, Mt. Vernon, Mo., M. D., Base Hospital No. 131, discharged June 13, 1919, rec. by W. R. Gahring and W. W. Marbal.

S. S. No. 63. Thurman Thos. Justice, Krebs Ave., Pascagoula, Miss., Medical Department, 142 Infantry, discharged June 27, 1919, rec. by Frank H. Freericks and J. W. England.

S. S. No. 64. Howard H. Phipps, Paynesville, Minn., Medical Department, U. S. A., General Hospital No. 43, National Soldiers Home, Va., rec. by D. M. Roberts and Frank H. Freericks.

S. S. No. 65. Thomas Gordon Bracking, Y. M. C. A., Minneapolis, Minn., Medical Corps, Surgical Service, discharged July 31, 1919, rec. by E. P. Quain and M. S. Chatfield.

S. S. No. 66. Clifton James Muir, Elizabeth Apartment, F. W. Ridge, Marquette, Mich., Sanitary Corps, U. S. A., on duty Camp Hospital, Camp Grant, Ill., rec. by Chas. S. C. Muir and Frank H. Freericks.

S. S. No. 67. John Kay, 1241 Hamilton Blvd., Detroit, Mich., Base Hospital No. 17, discharged May 17, 1919, rec. by Gertrude M. Palmer and Frank H. Freericks.

S. S. No. 68. Claude W. Behrens, Big Rapids, Mich., Medical Department, 57th U. S. Infantry, discharged April 3, 1919, rec. by Frank H. Freericks and J. W. England.

S. S. No. 69. William John McCannon, 239 Linden St., Wellesley, Mass., Hospital Corps, U. S. N. R. F., discharged July 31, 1919, rec. by Patrick J. Fitzpatrick and Frank H. Freericks.

S. S. No. 70. John Henry Hansen, 2524 Dulaney St., Baltimore, Md., still in service, rec. by Benjamin Hu and Frank H. Freericks.

S. S. No. 71. Charles Edmund McHale, 1014 First St., New Orleans, La., Navy Hospital, discharged February, 1919, rec. by E. A. Walsdorf and G. W. McDuff.

S. S. No. 72. Merle Arna Dunn, Meadville, Mo., U. S. Naval Station, New Orleans, La., discharged June 10, 1919, rec. by E. A. Ruddiman and W. D. Gleaves.

S. S. No. 73. Clovis J. Bouvier, 2137 Fern Cor. Sycamore St., New Orleans, La., Hospital Corps, U. S. N. R. F., discharged April 14, 1919, rec. by Jos. Ipser and F. S. Harvey.

S. S. No. 74. Burr C. Wright, Terrell, Iowa, Co. G., 2nd Infantry Repl. Troops, discharged December 31, 1918, rec. by Frank H. Freericks and J. W. England.

S. S. No. 75. Robert Royem, 2014 Lakeport St., Sioux City, Ia., Q. M. Corps, Ft. Des Moines, discharged May 2, 1919, rec. by P. A. Brecht and Lloyd Castle.

S. S. No. 76. Glenn Arthur Jones, Coon Rapids, Iowa, Medical Department, U. S. Army Base Hospital, discharged March, 5, 1919, rec. by Frank H. Freericks and J. W. England.

S. S. No. 77. Clement John FitzGerald, c/o Brady Drug Co., Mason City, Ia., 816 Aero Squadron, 6th Detachment, A. S. A. P., discharged March 18, 1919, rec. by Frank H. Freericks and J. W. England.

S. S. No. 78. Frank Morris Cravens, French Lick, Ind., Medical Detach., 335th Infantry, 84th Division, discharged February 22, 1919, rec. by Frank H. Freericks and J. W. England.

S. S. No. 79. Ivan Lloyd Thomson, 5301 Broadway, Chicago, Ill., Hospital Corps, U. S. N., U. S. S. Mercy, discharged April 22, 1919, rec. by H. C. Stigall and Frank H. Freericks.

S. S. No. 80. George Fred Masongarb, Geneseo, Ill., Medical Department, Attending Surgeon, Washington, D. C., discharged May 31, 1919, rec. by Frank H. Freericks and J. W. England.

S. S. No. 81. Ferdinand J. Leigh, 4338 West End Ave., Chicago, Ill., Base Hospital, Det., Camp Jackson, S. C., discharged March 12, 1919, rec. by Frank H. Freericks and J. W. England.

S. S. No. 82. Leo Anthony Lanigan, 2034 N. Kenneth Ave., Chicago, Ill., 58th F. A. Brigade, discharged as Captain June 25, 1919, rec. by Frank H. Freericks and J. W. England.

S. S. No. 83. Marco Adrogna, 3349 Monroe St., Chicago, Ill., 33rd Field Hospital. In service as patient at Ft. Sheridan Hospital, rec. by Frank H. Freericks and J. W. England.

S. S. No. 84. Charles Carter, Shoshone, Idaho, 361st Field Hospital, 316 Sanitary Tr., discharged May 8, 1919, rec. by E. W. Sinclair and J. Wesson.

S. S. No. 85. Chas. Franklin Turner, Tallapoosa, Ga., discharged December 17, 1918, rec. by Frank H. Freericks and J. W. England.

S. S. No. 86. Chas. Newton Gunter, Washington, Ga., Hospital Corps, U. S. Navy. In service, rec. by G. W. Shepard and C. G. Terrell.

S. S. No. 87. Wayne A. TenEyck, 703 E. 5th St., Ocala, Fla., Q. M. C. Truck Tr., discharged July 16, 1919, rec. by Frank H. Freericks and J. W. England.

S. S. No. 88. Joseph Trager, 871 Briggs Ave., Brooklyn, N. Y., Chemical Warfare Service, Washington, D. C., discharged December 5, 1918, rec. by Frank H. Freericks and A. N. Gilbert.

S. S. No. 89. Lewis Veola Grismond, 5626 Conn. Ave., N. W., Washington, D. C., 164th Ambulance Co., 41st Div., A. E. F., discharged March 1, 1919, rec. by T. L. Gill and Frank H. Freericks.

S. S. No. 90. Joseph A. Moakley, 452 Edgewood Ave., New Haven, Conn., Sanitary Detachment, 111th Mach. Gun Bn., discharged May 28, 1919, rec. by Frank H. Freericks and J. W. England.

S. S No. 91. John James Currans, 143 Green St., New Haven, Ct., Medical Det. 5th Balloon Co., discharged July 16, 1919, rec. by Frank H. Freericks and J. W. England.

S. S. No. 92. Joseph Henry Braschek, Del Norte, Col., Medical Corps, Col. Agr. College, discharged January 5, 1919, rec. by Chas. Dowman and Frank H. Freericks.

S. S. No. 93. Orville Wellington Brothers, 3220 Curtis St., Denver, Colo., Infantry Co. D., 354 Reg., 89th Division, discharged March 1, 1919, rec. by C. J. Sethel and John Martin.

S. S. No. 94. Henry C. Grinager, 555 North Towne St , Pomona, Cal., Mobile Hospital No. 12, A. E. F., discharged soon, rec. by Frank H. Freericks and J. W. England.

S. S. No. 95. Hannes S. Hernonen, 1613 Spring St., Little Rock, Ark., Army Field Clerk, Adjutant General's Dept., discharged July 1, 1919, rec. by Felix W. McClarkin and Frank H. Freericks.

S. S. No. 96. Lee Clyde Gammill, 508 Central Ave., Hot Springs, Ark., Hospital Corps, U. S. Navy, discharged as Optm., U. S. N., June 5, 1919, rec. by Frank H. Freericks and J. W. England.

S. S. No. 97. Joseph Bauer, U. S. Army, General Hospital No. 20, Whipple Barracks, Ariz., Medical Department, Sgt. first class, still in service, rec. by M. B. Levin and Frank H. Freericks.

S. S. No. 98. Jesse Jared Coleman, Pollard, Ala., Medical Dept., U. S. N., sti l in service, rec. by R. E. Ledbetter and L. Pachetker.

S. S. No. 99. Ray F. McMullen, P. O. Box 1048, Tonopah, Nev., Medical Corps, Medical Det., 314 Tr. Headquarters, 89th Division, discharged June 12, 1919, rec. by Jos. C. Pierry and G. A. Hoffman.

S. S. No. 100. Clifton V. Berry, 1637 N. W. 10th St., Washington, D. C., 368 Infantry, Hosp. Dept., discharged, rec. by Frank H. Freericks and J. W. England.

S. S. No. 101. Leo Elis Kesselman, 3134 Euclid Ave., Philadelphia, Pa., Chem. Warfare Service, U. S. A., discharged January 6, 1919, rec. by R. L. High and Frank H. Freericks.

S. S. No. 102. Dougal H. McCall, 824 Roscoe St., Chicago, Ill., U. S. Navy Hospital Corps, discharged February 24, 1919, rec. by John E. Woods and Frank H. Freericks.

S. S. No. 103. Arthur Leonard Mathison, Bisbee, N. D., Evacuation Hospital No. 15, A. E. F., discharged June 25, 1919, rec. by Frank H. Freericks and J. W. England.

S. S. No. 104. William Peter Terhaar, Mt. Angel, Ore., Infantry, Misc. Detach. (Med. Dept.), discharged May 23, 1919, rec. by Frank H. Freericks and J. W. England.

S. S. No. 105. John Freislinger, 4952 N. Oakley Ave., Chicago, Ill., 26th Co., U. S. Marines, discharged May 31, 1919, rec. by Frank H. Freericks and J. W. England.

S. S. No. 106. Pugh Bryan Harris, 427 N. 3 Notch St., Troy, Ala., U. S. Gen. Hospital No. 6, Medical Dept., still in service, rec. by Frank H. Freericks and J. W. England.

S. S. No. 107. Harold Clifton Wing, York Village, Me., Phar. Mate, 1 cl., Med. Corps., U. S. N., still in service, rec. by Frank H. Freericks and J. W. England.

S. S. No. 108. Francis Joseph Calla, 223 8th St., Jersey City, N. J., Artillery, discharged June 12, 1919, rec. by Frank H. Freericks and J. W. England.

S. S. No. 109. Alfred H. Rocheleau, 38 W. High St., Franklin, N. H., U. S. A. Laboratory, Med. Dept., discharged, June 21, 1919, rec. by D. F. Wettlin and Frank H. Freericks.

S. S. No. 110. Geo. Aubrey McMullen, 412 Franklin St., Tampa, Fla., Medical Detachment, 11th C. Ar., discharged December 6, 1918, rec. by Frank H. Freericks and J. W. England.

S. S. No. 111. Robert Edward Drewing, 656 So. 20th St., Lincoln, Neb., Hospital Corps, still in service, rec. by G. S. Davidson and Frank H. Freericks.

S. S. No. 112. George I. Phillips, Chamberlain, S. D., Medical Evacuation Hospital No. 48, discharged December 28, 1918, rec. by Frank H. Freericks and J. W. England.

S. S. No. 113. Joseph George Concialdi, Jr., New St., Rockaway, N. J., Chem. Warfare Service, discharged December 16, 1918, rec. by Lewis Concialdi and Frank H. Freericks.

S. S. No. 114. Leo F. Feindt, 184 Valley St., South Orange, N. J., U. S. N. R. F., discharged February 6, 1919, rec. by Garrett Byrnes and Frank H. Freericks.

S. S. No. 115. Hunter Huddle, Orange Drug Co., Orange, Texas, Medical Department, Base Hospital, discharged March 8, 1919, rec. by Frank H. Freericks and J. W. England.

S. S. No. 116. Archie LeRoy Worthington, 265 North St., Rochester, N. Y., Medical Department, U. S. Army, discharged April 28, 1919, rec. by Frank H. Freericks and J. W. England.

S. S. No. 117. Oliver Wendell Lomady, 2317 E. Sergeant St., Philadelphia, Pa., Medical Dept., 320th Infantry, 80th Div., discharged June 7, 1919, rec. by Frank H. Freericks and J. W. England.

S. S. No. 118. George Charles Curtis, 26 Churchill St., Little Falls, N. Y., Chief Pharmacist's Mate, U. S. N., U. S. S. Warrington, rec. by M. J. Coats and Dr. John Hurley.

S. S. No. 119. Rudolph Weiss, 104 Prospect St., Winfield, L. I., N. Y., Hospital Corps., U. S. N., still in service, rec. by R. S. Lehman and P. Jaffe.

S. S. No. 120. Henry Craif Hamilton, Durango, Colo., Hospital Corps, U. S. N., discharged June 19, 1919, rec. by Frank H. Freericks and J. W. England.

S. S. No. 121. Charles Pleasant Clark, U. S. Receiving Ship, Dispensary R., Norfolk, Va., Medical Dept., U. S. S. Wheeling, still in service.

S. S. No. 122. Clell D. Miller, Vivian, La., Sanitary Squad No. 54, Medical Dept., discharged June 13, 1919, rec. by C. H. McEachem and Claude S. Posey.

S. S. No. 123. Charles Kingsley Williams, Port Allegany, Pa., U. S. N. Hospital Corps, still in service, rec. by Frank H. Freericks and J. W. England.

S. S. No. 124. Douglas D'Mare, 37 Sherman St., Newport, R. I., U. S. Navy Med. Dept., still in the service, rec. by John D. Milligan and R. E. Ledbetter.

S. S. No. 125. Lloyd Cecil Rath, 312 Huntington Ct., Madison, Wis., Medical Corps, 107 T. M. B., discharged December 31, 1918, rec. by Edward Kremers and Nellie Wakeman.

S. S. No. 126. Edward George Lehman, 229 S. Elm St., Fairmont, Minn., First Bn., Intelligence Section, 310th Infantry, discharged July 28, 1919, rec. by Frank H. Freericks and J. W. England.

S. S. No. 127. Gust Silberberg, 531 W. Division St., Chicago, Ill., Navy Hospital Corps, discharged August 8, 1919, rec. by A. Muscahof and E. John Mark.

S. S. No. 128. Harry Marshall Green, 3217 N. Carlisle St., Philadelphia, Pa., Medical Department, U. S. Army, discharged June 12, 1919, rec. by B. J. Hanington and Benj. Krehl.

S. S. No. 129. Walter Finch Flayhart, Fairmount Ave., Towson, Baltimore, Md., Medical Department, U. S. Navy, still in service, rec. by B. H. Carroll and A. R. Marsh.

S. S. No. 130. George Francis Colombe, 5422 Garfield St., New Orleans, La., Radio operator, inactive service list., rec. by L. C. Falker and J. Fred Colombe.

S. S. No. 131. Fred C. Mink, Cassville, Wis., Chief Pharmacist's Mate, U. S. Navy, still in service, rec. by Frank H. Freericks and J. W. England.

S. S. No. 132. Raymond Francis Murray, River Falls, Wis., Medical Department, 161 Depot Brigade, discharged April 1, 1919, rec. by Frank H. Freericks and J. W. England.

S. S. No. 133. Malcolm Conant Davis, The Rexall Store, Oilton, Okla., Evacuation Hospital 7, discharged, Camp Pike, May 28, 1919, rec. by Frank H. Freericks and J. W. England.

S. S. No. 134. Henry Clay Newsome, Mooresville, N. C., Medical Dept., 306 Am. Tr., 81st Division, discharged June 26, 1919, rec. by Frank H. Freericks and J. W. England.

S. S. No. 135. Roy Everett Enloe, U. S. A. Emb. Hospital No. 1, Hoboken, N. J., Medical Department, U. S. Army, in the service, rec. by T. C. Duck and H. C. Mowery.

S. S. No. 136. William D. Walters, 161 E. McMiken Ave., Cincinnati, O., San. Corps, Capt. Medical Supt. Office, discharged at once, rec. by Frank H. Freericks and G. Horstmann.

S. S. No. 137. Louis Paul Schubert, R. F. D. No. 2, Bound Brook, N. J., Medical Department, U. S. A. General Hospital No. 5, still in service, rec. by Joseph Zrubek and Frank H. Freericks.

S. S. No. 138. Robert Franklin Ligan, 189 S. Front St., Steelton, Pa., Medical Det., 103rd Supply Tr., discharged May 20, 1919, rec. by Charles H. LaWall and Jos. E. Harrisson.

S. S. No. 139. Sam W. Via, Senath, Mo., Bat. F., 342nd F. A. and Medical Department, discharged January 16, 1919, rec. by Frank H. Freericks and J. W. England.

The subject of the election of these applicants and their status in the Association was discussed, the previous action being reconsidered.

On motion of Dr. A. R. L. Dohme, seconded by J. H. Beal, the applicants were duly elected members.

J. A. Koch moved, seconded by H. V. Arny, that the dues of such members up to January 1, 1921 be remitted.

As a substitute motion, George M. Beringer moved, seconded by C. M. Snow, that the Council appropriate the sum of five dollars for dues for each member elected, the members to receive the publications of the Association.

The substitute for the original motion failed of passage, and the original motion, on being put, carried.

The Secretary asked for instructions as to the disposition by him, as Secretary of the Council, of future applications for membership, from soldier, sailor and marine pharmacists, received after the adjournment of this annual meeting; and, on motion of J. A. Koch, seconded by Dr. A. R. L. Dohme, he was directed to send out all such applications in Council Letters for election by mail as for regular members.

The Report of the Committee on Recipe Book was presented and action on its recommendations postponed until a future meeting.

The report was as follows:

REPORT OF COMMITTEE ON RECIPE BOOK.

To the members of the Council:

That the War has even hampered the progress of the A. Ph. A. Recipe Book can be seen from the non-publication of formulas in the Journal, much to the regret of its editor, as well as other editors, who were in the habit of copying these formulas.

Owing to the fact that the Chairman's son served in the Medical Corps of the Army and his clerk in the Hospital Corps of the Navy, he was compelled to do three men's work at the rate of 18 hours per day during more than a year. This is his excuse for the apparent neglect on the work of the Recipe Book, as well as other activities, pharmaceutical and chemical.

A meeting of the Committee on Recipe Book will be held on the boat on Friday P.M. and the work will be resumed at once. Members are asked to attend this meeting and to present plans. That the formulas published thus far have been of use to the pharmaceutical profession can be seen from the fact that they are frequently quoted in pharmaceutical journals and books. It is, however, to be regretted that due credit is not always given.

At present the Committee consists only of fourteen members, due to the loss of the immortal Martin I. Wilbert. To restore the original "Fifteen Committee" the Chairman recommends that the Council appoint another member, time to expire in 1920. I would suggest the appointment of a member acquainted with formulas frequently called for by retail pharmacists throughout the United States.

Respectfully submitted,

OTTO RAUBENHEIMER, *Chairman*,
E. FULLERTON COOK,
IRWIN A. BECKER,
CHARLES H. LAWALL,
CURT P. WIMMER.

The Report of the Committee on Standards was presented by Chairman J. A. Koch, as follows:

REPORT OF COMMITTEE ON STANDARDS.

To the Council of the American Pharmaceutical Association:

The work of the Committee on Standards of Drugs and Chemical Products has been practically at a standstill for the greater part of the last year, the conditions prevailing at the time of the last report of the Committee having continued until a short time ago when active work on the part of the members was again resumed. It is hoped that substantial progress will be made from now on.

Copies of the only monographs adopted during the year are appended.

The terms of four members of the Committee, Elmer E. Wyckoff, E. L. Newcomb, L. D. Haverhill and J. A. Koch expire this year and it will be necessary for the Council to elect their successors.

Respectfully submitted,

J. A. KOCH, *Chairman*.

STRONTII LACTAS.

STRONTIUM LACTATE.

1. Hydrated strontium lactate ($Sr(C_3H_5O_3)_2 + 3H_2O = 319.76$) containing, after drying to constant weight at 120° C., not less than 98 percent of anhydrous strontium lactate ($Sr(C_3H_5O_3)_2 = 265.71$). Preserve it in well-closed containers.

2. Strontium Lactate occurs as a white, odorless powder, almost tasteless.

3. It is freely soluble in water; very slightly soluble in alcohol.

4. An aqueous solution of the salt (1:20) is neutral, slightly acid or slightly alkaline to litmus, but it is not reddened by phenolphthalein T. S.

5. The salt imparts to a non-luminous flame a crimson color. With calcium sulphate T. S. its aqueous solution (1:20) slowly forms a white precipitate; the precipitation occurs quickly with a solution of sodium or potassium sulphate or diluted sulphuric acid.

6. Mix 5 mils of an aqueous solution of the salt (1:20) with 10 mils of diluted sulphuric acid, add potassium permanganate and warm the mixture; the odor of acetaldehyde is evolved.

7. Dissolve 1 Gm. of Strontium Lactate in 5 mils of distilled water; filter the solution if necessary and add one drop of acetic acid and 5 drops of potassium dichromate T. S.; no turbidity is produced within 3 minutes (barium).

8. Ignite 1 Gm. of the salt, treat the residue with 20 mils of diluted nitric acid, filter and wash the residue with hot water. Evaporate the filtrate and washings to dryness on the water-bath, dry the residue at 100° C, then powder it and digest with 15 mils of dehydrated alcohol for half an hour. Filter, evaporate the filtrate to dryness on the water-bath and dry at 100° C. The weight of the residue is not more than 0.01 Gm. (Calcium, magnesium).

9. An aqueous solution of the salt (1:50) does not respond to the U. S. P. test for heavy metals.

10. Stir about 0.5 Gm. of the salt with 2 mils of sulphuric acid; the mixture does not emit the odor of volatile fatty acids even on warming.

11. Dried to constant weight at 120° C the salt loses not more than 16.91 percent of its weight.

12. Incinerate about 2 Gm. of the salt, previously dried to constant weight at 120° C and accurately weighed, dissolve the residue by boiling with 50 mils of half-normal hydrochloric acid, cool, and titrate the excess of acid with half-normal sodium hydroxide, using methyl orange as indicator. It shows not less than 98 percent of anhydrous Strontium Lactate. Each mil of half-normal hydrochloric acid corresponds to 0.05393 Gm. of anhydrous Strontium Lactate.

POTASSII GUAIACOLSULPHONAS.

POTASSIUM GUAIACOLSULPHONATE.

1. The potassium salt ($C_6H_3OHCH_3OSO_3K = 242.23$) of guaiacolsulphonic acid. Preserve it in well-closed containers protected from light.

2. Potassium Guaiacolsulphonate occurs in white crystals or as a white crystalline powder; odorless and having a bitter taste. On exposure to air and light it slowly acquires a pink or brownish color.

3. One Gm. dissolves in about 5 mils of water; it is insoluble in alcohol.

4. An aqueous solution of the salt (1 in 20) is neutral or slightly alkaline to litmus, but 10 mils of the solution are not reddened by a drop of phenolphthalein T. S.

5. To a non-luminous flame Potassium Guaiacolsulphonate imparts a violet color. Sodium Bitartrate T. S. produces in its aqueous solution (1 in 20) a white crystalline precipitate which is soluble in aqueous solutions of alkali hydroxides or carbonates and in diluted mineral acids.

6. Ferric chloride T. S. colors its aqueous solution (1 in 100) deep violet-blue.

7. The addition of silver nitrate T. S. to 10 mils of an aqueous solution of the salt (1 in 100) produces no immediate turbidity (Chloride); but after a few minutes the solution becomes turbid due to separation of metallic silver.

8. Barium chloride T. S. when added to 10 mils of its aqueous solution (1 in 20) previously acidulated with 3 drops of hydrochloric acid causes at most only a slight turbidity (Sulphate); but if the salt be first ignited, the residue treated with hot water and filtered, the filtrate when acidulated with hydrochloric acid yields with barium chloride T. S. a copious white precipitate.

9. An aqueous solution of the salt (1 in 50) does not respond to the U. S. P. test for heavy metals.

10. Dried to constant weight over sulphuric acid, the salt loses not more than two percent of its weight.

11. Ignite about 1 Gm. of Potassium Guaiacolsulphonate, previously dried to constant weight over sulphuric acid and accurately weighed in a porcelain crucible or dish until most of the carbonaceous matter has burned off, cool, add to the residue a few mils of diluted sulphuric acid, evaporate and cautiously ignite to constant weight. The weight of the potassium sulphate so obtained corresponds to not less than 35.3 percent nor to more than 36 percent of the weight of the dried Potassium Guaiacolsulphonate taken.

On motion of W. B. Day, seconded by J. G. Godding, the report was received and ordered spread upon the minutes.

Chairman H. V. Arny, of the Committee on Research, requested action on the following recommendations:

(1) That when a "grant" is made the successful contestant shall be notified; that the results of his work shall be published first in the Journal of the Association. Carried.

(2) That when published in the Journal the article shall be accompanied by the statement that the work was done by grant of the American Pharmaceutical Association and that if republished elsewhere it must be accompanied by such statement, credit being given, also, to the Journal. Carried.

(3) That it shall be the duty of the Committee on Research to report annually both to the Council and to the Scientific Section, the two reports to be not the same, necessarily. Carried.

On motion of C. H. LaWall, seconded by Dr. A. R. L. Dohme, the Reporter on the Progress of Pharmacy was authorized to present an annual report at one of the general sessions of each annual meeting of the Association.

R. W. Terry suggested the desirability of giving in the Journal of the American Pharmaceutical Association a bibliography of pharmaceutical literature of other pharmaceutical journals.

Editor E. G. Eberle stated that he believed this would be desirable and could readily be done.

On motion of J. W. England, seconded by E. G. Eberle, the subject of having a pharmaceutical bibliography in the Journal was referred to the Committee on Publication with a favorable recommendation.

Wortley F. Rudd stated that he would like an opportunity to discuss the policy of the Journal and it was decided to have the discussion on this question at the meeting of the Council to be held on Thursday, August 28, 1919.

Adjourned until Thursday, August 28, 1919 at 4.30 P.M.

J. W. ENGLAND, *Secretary*.

FOURTH SESSION OF THE COUNCIL, 1918–1919.

The fourth session of the Council of the American Pharmaceutical Association for 1918–19 was held at the Hotel Pennsylvania, New York, on Thursday, August 28, 1919 at 5 P.M., Chairman L. C. Hopp presiding.

Present: Messrs. H. V. Arny, James H. Beal, G. M. Beringer, Theo. J. Bradley, W. B. Day, Dr. A. R. L. Dohme, E. G. Eberle, F. R. Eldred, J. W. England, E. N. Gathercoal, John G. Godding, S. L. Hilton, Lewis C. Hopp, E. F. Kelly, E. H. La Pierre, F. W. Nitardy, W. F. Rudd, Dr. F. E. Stewart, Dr. H. M. Whelpley, C. M. Snow, Caswell A. Mayo, J. A. Koch, C. H. LaWall and C. E. Caspari.

On motion of J. W. England, seconded by W. B. Day, the usual order of business was suspended and the floor was given to Chairman James H. Beal to present the report of the Commission on Proprietary Medicines.

(Report will be printed hereafter.)

On motion of J. W. England, seconded by S. L. Hilton, the report was received and the recommendation that a questionnaire, regarding the subject of formula disclosure, be mailed to pharmacists, was approved.

The minutes of the previous meeting were read and approved.

The Report of the Committee on Drug Store Classification was presented by Chairman Jacob Diner. It was as follows:

Report of Special Committee "To consider and report on the question of two classes of pharmacies and corresponding courses in colleges of pharmacy."

To the members of the Council:

Even a superficial consideration of the subject brings out the enormity of the task which this committee undertook. Nor do we harbor the belief that our report is complete. It is, at best, but a mere outline containing the suggestion of many men and is submitted with the hope that a free discussion will enable us to formulate a complete outline of both the classification of pharmacies and the college courses, to the end that pharmacy may at last claim a well-deserved position among the professions.

Your Committee feels that the question of the advisability of separating Drug Stores and Pharmacies should be answered by the pharmacists themselves. We are certain, however, that whatever the answer may be no success can be looked for unless the whole-hearted backing of the N. A. B. P., the A. C. of Ph. F. and legislative committees can be secured of the State Pharmaceutical Associations of the U. S. P.

Assuming that there is need for separation and classification of pharmacies the following suggestions are submitted for your consideration:

A. DRUG STORES.

A. Drug store. B. Pharmacies.

1. *Scope.*—The sale of all articles now commonly found in pharmacies excepting poisons not used for commercial or household purposes (such as paris-green, oxalic acid and the like).

2. *Qualifications.*—(*a*) Owner to be a graduate from a recognized school or college of pharmacy, requiring four years High School as preliminary education and not less than two years' attendance at the school previous to graduation. Provided, however, that this restriction shall not hold against any person possessing the proper degree as at present understood at the time that the act becomes effective, nor against any person at that time matriculated for such a degree in a recognized school of college.

(*b*) Owner must be licensed in the state in which he conducts his business.

3. *Assistants.*—Non-licensed assistants may make sales of all goods not used as remedial agents without direct supervision of a licensed pharmacist, and may sell remedial agents ONLY under direct supervision of a licensed pharmacist.

4. *Equipment.*—(*a*) Latest edition of U. S. P. N. F. and Dispensatory.

(*b*) Scales and complete sets of weights of both systems.

(*c*) Graduates or measuring glasses of both systems.

(*d*) A sufficient assortment of all other utensils necessary to carry on the business of pharmacy.

B. PHARMACIES.

1. *Scope.*—(*a*) Preparation of galenicals and other pharmaceutical products.

(*b*) Compounding prescriptions and sale of poisons.

(*c*) Examination of drugs, foods, body-fluids.

(*d*) Preparation and sale of biological products.

(*e*) Sale of sick-room appliances.

2. *Qualifications.*—(*a*) Individual ownership.

(*b*) Owner to be a graduate from recognized school or college of pharmacy having a four years' High School preliminary requirement and not less than four years' professional training course.

(*c*) Owner must be licensed by the state to practice pharmacy.

3. *Assistants.*—While unlicensed assistants or such having lesser qualifications than those required of owner may be employed they are not permitted to take charge of a pharmacy nor to perform work mentioned under *a* to *d* (inclusive) except under the direct supervision of a fully qualified pharmacist.

4. *Equipment.*—To include in addition to those generally found in pharmacies:

(*a*) A compound microscope with oil immersion lens.

(*b*) An incubator with thermo-regulator.

(*c*) Sterilizers: steam, hot air, autoclave.

(*d*) Electric centrifuge.

(*e*) Analytical balance sensitive to not less than 0.1 mg.

(*f*) A working library to include latest edition of U. S. P., N. F. and Dispensatory.

SCHOOLS AND COLLEGES.

1. A school may engage in the teaching of both the proposed courses and in the turning out of both classes of graduates.

2. The work of the lower course may subsequently be accepted as the first part of the higher course. A graduate of the lower course may, by attendance at the school, make up that part of the first two years' higher course which is not included in the lower course and then be admitted for advanced standing in the higher course.

COURSES.

Course 1, leading to degree of Ph.G. Requirements.—Four years' high-school preliminary education, or its equivalent as accepted by the Regents or Education Department of the state in which school is located.

Course.—Two years, in two different calendar years, of three days each week, 30 weeks each year, and not less than a total 1200 hours.

Curriculum.—As outlined in the Pharmaceutical Syllabus.

Course 2, leading to degree of B.S. in Pharmacy. Requirements.—Four years preliminary as for Course 1.

Course.—Four years, during four different calender years, of 30 weeks each year, five and a half days each week and not less than 800 hours each year.

This course may be divided into two equal periods of two years each. During the first two years the course in pharmacy may follow the outline of the Pharmaceutical Syllabus and in addition the following subjects are to be included:

Advanced English; a foreign language; Mathematics; Laboratory Physics; History, including the history of pharmacy and chemistry.

The last two years are to include:

(*a*) Pharmacy; The making of more complex preparations, not taken up in Course 1; Testing and assaying of galenicals.

(*b*) Chemistry, physical chemistry, advanced inorganic including analytical, synthetic and analytical organic chemistry, biological chemistry, including that of body fluids.

(*c*) Materia Medica; Advanced Physiology; Botany and Pharmacognosy; Pharmacodynamics.

(*d*) Bacteriology; general; special (the pathogenic bacteria); Immunology, including the preparation of vaccines.

(*e*) Clinical Diagnosis; chemical and microscopical.

(*f*) Food and Drug analysis; chemical, bacteriological and microscopical.

In conclusion, we wish to extend our heartfelt thanks to all those who coöperated in the outline and especially to Drs. Rusby, Jordan, Kelly, LaWall, Bradley, Kraemer and Stewart, who gave us many valuable suggestions and constructive criticisms, much of which is embodied in this report.

Respectfully submitted by the Joint Committee of the American Pharmaceutical Association and the American Conference of Pharmaceutical Faculties.

JACOB DINER, *Chairman.*
F. E. STEWART,
E. F. KELLY,
C. VON HERMAN.

On motion of J. H. Beal, seconded by F. E. Stewart, the report was received and referred to the Committee on Publication.

Applications for membership from Nos. 573 to 577 inclusive were presented and favorably acted upon. The applications were:

No. 573. Harry Zwilling, 108 Pitt St., New York, N. Y., rec. by Jacob Diner and G. Horstmann.

No. 574. Robert J. Gordon, 176 Varet St., Brooklyn, N. Y., rec. by Joseph L. Mayer and E. G. Eberle.

N o. 575. Harry Kaminsky, 79 Graham Ave., Brooklyn, N. Y., rec. by Joseph L. Mayer and E. G. Eberle.

No. 576. Welland, John Orchard, 25 First Ave., West, Dickinson, N. D., rec. by W. P. Porterfield and E. L. Newcomb.

No. 577. Leo Waldeman Geisler, 53 Fulton St., East Orange, N. J., rec. by Hugo Kantrowitz and Geo. C. Diekman.

The report of the Committee on Soldier and Sailor Pharmacists was presented by Chairman Frank H. Freericks, (See October, 1919 Journal A. Ph. A., page 862).

On motion of F. E. Stewart, seconded by H. V. Arny, the report was received and referred to the Committee on Publication.

On motion of H. V. Arny, seconded by E. G. Eberle, the Committee on Soldier and Sailor Pharmacists was continued for another year.

On motion of H. V. Arny, seconded by E. G. Eberle, a rising vote of thanks was directed to be given to Chairman Freericks and his Committee for the splendid service they had rendered, which was done.

Three applications for membership from soldier and sailor pharmacists were submitted and favorably acted upon. These were:

S. S. No. 140. Paul Joseph Fiorentino, 343 E. 11th St., New York, N. Y., rec. by C. O. Bigelow and R. P. Fischelis.

S. S. No. 141. Joseph Cagnasso, 336 W. 26th St., New York, N. Y., rec. by C. O. Bigelow and R. P. Fischelis.

S. S. No. 142. Joseph Sieke, 2494 Elm Place, New York, N. Y., rec. by G. Horstmann and J W. England.

F. W. Nitardy presented a recommendation from the Section on Practical Pharmacy and Dispensing that certain formulas for medicated alcohol proposed by the Section be approved by the Council and submitted to the Treasury Department for consideration. Carried.

On special order of business, W. F. Rudd discussed the policy of the Journal of the Association, and made a number of suggestions.

On motion of E. F. Kelly, seconded by W. R. White, the subject was referred to a special committee of three, to be appointed by the incoming president of the Association, to act in conjunction with the Committee on Publication, as a joint committee, to consider the suggestions proposed with power to act.

On motion of H. V. Arny, seconded by F. R. Eldred, the previous action of the Council at this meeting on the subject of special formulas for medicated alcohol for submission to the Treasury Department, was directed to be reconsidered.

On motion of James H. Beal, seconded by Clair A. Dye, the further consideration of this motion was postponed for the present.

R. P. Fischelis reported the organization of the World War Veterans Section on August 26, 1919 and submitted proposed by-laws for the government of the Section, together with certain resolutions, and asked approval of the same by the Council.

(See October, 1919 Journal A. Ph. A., pages 866 to 870.)

On motion of J. W. England, seconded by W. B. Day, the organization of the Section was approved and the proposed by-laws and resolutions were received and referred to the Committee on Revision of Constitution and By-laws with power to act after consultation with the officers of the World War Veterans Section.

On motion of H. V. Arny, seconded by W. R. White, a special committee of three was directed to be appointed to consider the subject of the financing of the propaganda for membership proposed by the World War Veterans Section, this committee to confer with the officers of the Section on World War Veterans, the committee to report later. Chairman Hopp named the following committee: Messrs. James H. Beal, H. M. Whelpley and J. A. Koch.

W. B. Day submitted a copy of the revised by-laws of the Women's Section of the American Pharmaceutical Association and asked, on behalf of the Women's Section, for approval by the Council, which was granted.

(To be Continued.)

"THEY ARE BUDDIES OF MINE."

BY CLYDE L. EDDY.*

Late in the afternoon of November 9, 1918, a heavy touring car, bearing the insignia of the General Staff on its wind shield, was ploughing along through the mud on the highway between Toul and First Army Headquarters up at Souilly. It was raining—as it almost always was over there—and the fine mud fairly sprayed from the wheels of the car as the party pushed ahead through the slow moving convoys in an effort to reach Ligny before dark.

Suddenly the machine swung around a curve in the road and overtook a detachment of doughboys plodding along with full packs on their shoulders. The rain dripped from the brims of the steel helmets they were wearing and poured in tiny streams from the down-turned muzzles of their rifles. As the car approached them the officer in charge of it leaned over toward the chauffeur and said, "Drive slowly going by these boys and don't splash any mud on them; *they are buddies of mine.*"

That officer had important business at headquarters and if the car had gone roaring by like an express train, showering the men with mud, there would have been no complaint from them. *C'est le guerre.* It is all a part of war. But he knew that he could reach his destination in time even if he lost a few minutes along the way and he was not willing to add any to the hardships of those buddies of his.

The fine spirit that made "buddies" of us over there—and over here—during the war should hold us together now. As pharmacists, we have much in common aside from our memories of "gold fish," "monkey meat," "K. P." and *beaucoup boue.* There is much we can do if we choose to work together. The American Pharmaceutical Association has organized a War Veterans' Section and every pharmacist who served in any capacity in the Army, Navy or Marine Corps or who did his, or her, bit in welfare work, is eligible, this year, to join the new section *and the association* without the payment of dues.

Among other things the section is compiling a record of the work done by pharmacists during the war with the view to proving that the duties many of them performed were of sufficient importance to warrant the creation of a commissioned pharmaceutical corps in the Army. Facts are required and the men best qualified to furnish those facts are the men who did pharmaceutical service during the war. Other work will be taken up later and every pharmacist who is eligible to join the new section should indicate his desire to do so now by communicating with the secretary, W. D. Walters, Fifth and Pike Streets, Cincinnati, Ohio. There is no red tape connected with it—a postal card will do. Let's Go!

* Chairman, Publicity Committee, World War Veterans Section, American Pharmaceutical Association.

EDITORIAL NOTES

Editor: E. G. EBERLE, Bourse Building, Philadelphia, Pa.

Committee on Publication: J. W. ENGLAND, *Chairman;* G. M. BERINGER, CASWELL A. MAYO, H. B. MASON, E. L. NEWCOMB, and the Editor-in-Chief of the JOURNAL, General Secretary, Treasurer and Reporter on the Progress of Pharmacy, *ex-officio.*

SODIUM CACODYLATE IN A MODIFIED DONOVAN'S SOLUTION.

E. Crouzel, in *Repertoire de Pharmacie,* 30, 129, 1919, proposes the substitution of sodium cacodylate for the arsenious oxide employed in the French formula. It is contended that a more stable preparation results; the quantities of the constituents are, one gramme each of sodium cacodylate, potassium iodide and mercuric iodide and 97 grammes of water.

ISOTONIC SOLUTIONS FOR HYPODERMIC INJECTION.

v. Itallie (*Pharm. Weekbl.*) holds that the injurious by-effects, such as pain, etc., occasionally produced when applying alkaloidal solutions hypodermically, usually result from the solutions not being isotonic. He, therefore, recommends using only such solutions as have the average freezing point of human blood serum. This freezing point can either be estimated experimentally or can be calculated in the usual way. The amounts of sodium chloride necessary to be added to alkaloidal solutions of definite strength in order to obtain isotonic solutions are given as follows:

A 1 percent morphine hydrochloride solution requires the addition of 0.76 percent of sodium chloride.

A 1 1/2 percent morphine hydrochloride solution the addition of 0.69 percent of sodium chloride.

A 2 percent morphine hydrochloride solution, 0.62 percent of sodium chloride.

A 3 percent morphine hydrochloride solution, 0.48 percent of sodium chloride.

A 1 percent cocaine hydrochloride solution requires the addition of 0.74 percent of sodium chloride.

A 6 percent cocaine hydrochloride solution does not require any addition of sodium chloride.

A 1 percent novocain hydrochloride solution requires the addition of 0.69 percent of sodium chloride.

A 2 percent novocain hydrochloride solution, 0.51 percent of sodium chloride.

A 1 percent atropine sulphate solution requires the addition of 0.79 percent of sodium chloride.

A 1 percent emetine hydrochloride solution requires the addition of 0.82 percent of sodium chloride.

A 3 percent emetine hydrochloride solution, 0.68 percent of sodium chloride.

A 5 percent emetine hydrochloride solution, 0.45 percent of sodium chloride.

A 1/2 percent arecoline hydrobromide solution requires the addition of 0.80 percent of sodium chloride.—Through *Druggists Circular.*

THE FATE OF SALICYLATES IN THE BODY.

One of the fundamental requisites in the rational, as contrasted with the purely empiric, use of drugs is a knowledge of precisely what happens to them in the organism, as well as of what pharmacologic effects they exert. In the long run, the influence of a potent substance may depend not only on its immediate manifestations but also on delayed reactions due to accumulations of an active compound. Some foreign substances are very promptly excreted; others tend to be stored to a greater or less extent, so that they can manifest cumulative effects; still others are in some measure destroyed within the organism. Scientific therapy must be based on a knowledge of the fate of the drugs that it employs.

The older literature on the salicylates, one of the most widely used groups of therapeutic agents, gives the impression that the salicyl radical leaves the body virtually unchanged.[1] According to the more recent investigations of Hanzlik[2] and his collaborators at the Western Reserve University School of Medicine, however, about 20 percent of salicylate administered to normal human individuals is de-

[1] Nencki, M., *Arch. f. exper. Path. u. Pharmakol.,* 20, 367, 1886. Mosso, *Ibid.,* 26, 267, 1889.

[2] Hanzlik, P. J., Scott, R. W., and Thoburn, T. W., *J. Pharmacol. & Exper. Therap.,* 9, 247 (Feb.) 1917.

stroyed, since the loss cannot be accounted for in sweat and feces, or by retention in the body. According to the view of Hanzlik and Wetzel,[3] this destruction is not associated with any special organs, but appears rather to be dependent on the general functions of metabolism. It goes on in excised organs and apparently in tissue pulp. The power to destroy salicylates is by no means limited to the organs of the higher animals; for Hanzlik and Wetzel have recently ascertained that weak solutions of sodium salicylate gradually deteriorate unless they are protected from microbiotic forms by means of efficient antiseptics. Yeasts and fungi can destroy the drug.

If the destruction of the salicyl group is a function of metabolic activity in general, it might be expected that the disappearance of salicylates will be facilitated wherever metabolism itself is augmented. In harmony with such a hypothesis, Hanzlik and Wetzel note increased loss of administered salicylate in fevers, principally in rheumatism and tuberculosis. In nephritis, in which the retention of the drug because of diminished renal excretory capacity might expose it to a greater chance of destruction by the tissues, the theory seems to be confirmed by the observed facts. Drug habitués addicted to the use of alcohol and morphine were found to excrete much less salicyl than normal persons, owing perhaps to an acquired power of their organisms for increased destruction of drugs.

It is in fact familiar to therapeutics that a low concentration of salicyl in the blood and tissues which must be the result of smaller doses of salicylates and related compounds, is not an effective antiseptic within the body. The destruction of the drug may afford the reason for this and also indicate why large doses are required to secure therapeutic effects. —Editorial *J. A. M. A.*

THE ACIDITY OF CHAULMOOGRA OIL.

In a recent letter (*Pharmaceutical Journal*, August 23, p. 195) Mr. F. F. Shelly pointed out the wide divergence in the acidity of commercial samples of Chaulmoogra Oil, and showed that the limits set by the British Pharmacopoeia are unsatisfactory. In order to further elucidate this matter, a search was made in the literature on the subject, and a few experiments performed to determine the influence of the method of preparation, and of time, on the acidity of the oil.

A full account of the earlier work on Chaulmoogra is given by Lepage ("Papers on the Plant *Gynocardia odorata*," 1878), and reference to subsequent literature is made by Schindelmeister (*Deutsch. Pharm. Ges. Ber.*, 14, 164, 1904), but although many of these papers deal with the constituents of the oil, no information is given as to the amount of free acid present. The table below gives the acid value as found by later investigators:

Author.	Source.	Acid val.	Periodical.
Hirschsohn..	Cold-pressed	26.84	*Pharm. Centralbl.*, 44, 627, 1903
Hirschsohn..	Warm-press'd	25.54	*Pharm. Centralbl.*, 44, 627, 1903
Hirschsohn..	Extracted c. petrol ether.	21.14	*Pharm. Centralbl.*, 44, 627, 1903
Hirschsohn..	Commercial A	87.33	*Pharm. Centralbl.*, 44, 627, 1903
Hirschsohn..	Commercial B	34.44	*Pharm. Centralbl.*, 44, 627, 1903
Hirschsohn..	Commercial C	70.56	*Pharm. Centralbl.*, 44, 627, 1903
Hirschsohn..	Commercial D	37.60	*Pharm. Centralbl.*, 44, 627, 1903
Power and Gornall....	Expressed	23.0	*J. Chem. Soc.* (*Tr.*), 85, 843, 1904
Power and Gornall....	Extracted	9.5	*J. Chem. Soc.* (*Tr.*), 85, 843, 1904
Schindelmeister...	Cold-pressed	25.2	*Loc. cit.*
Reinsch.....	Commercial	25.04	*Chem. Zeit.*, 35, 77, 1911

Of the five commercial samples analyzed, it will be seen that only one has an acid value satisfying the b. p. requirements, but it should be mentioned that some of the oils analyzed by Hirschsohn may have been, and probably were, adulterated.

Further information on the subject is found in Evans' "Analytical Notes" (1910–1913), the values for the acidity of Chaulmoogra Oil therein given varying between 9.5 and 56.0.

A similarly wide range was observed in a few samples examined in the laboratories of the Society of Apothecaries; in the table below other analytical figures are given, besides the acidity, to show that the oils were genuine:

[3] Hanzlik, P. J., and Wetzel, N. C.: The Salicylates, XI, The Stability and Destruction of the Salicyl Group under Biological Conditions, *J. Pharmacol. & Exper. Therap.*, 14, 25 (Sept.) 1919.

No.	Source.	Acid value.	Iodine value.	M. Pt.
1	Expressed from seeds..	8.3	100.9	25–26°
2	Extracted from seeds..	7.7	98.3	24°
3	Commercial A.....	31.0	101.2	...
4	Commercial B.....	58.7	100.7	28°
5	Commercial C.....	52.9	96.8	...
6	Commercial D.....	18.5	101.8	25°
7	Commercial E.....	39.6	102.0	26°
8	Commercial F.....	76.7	100.3	31°

The seeds from which the first two oils were obtained had been imported from India, and their genuineness checked at the Royal Botanic Gardens.

The acidity of samples 1, 2, 4 and 6 was determined subsequently after the lapse of various periods of time, with interesting results:

	Acid Number.				
No.	When obtained.	After 2 weeks.	After 4 months.	After 8 months.	After 1 year.
1	8.6	8.6	9.2	....	19.2
2	7.7	...	...	....	10.1
4	18.5	...	...	22.1	....
6	58.7	...	...	....	61.4

These results show beyond doubt that *the acidity of the oil increases with time*, but the change is not regular. The increase in the acidity of Chaulmoogra oil on keeping had previously been observed by Marcon (*Thèse*, Montpellier, 1886), who remarks that the oil expressed in the cold keeps well, while the hot-expressed oil, as well as that obtained by maceration of the seeds in boiling water, soon becomes rancid.

As regards the influence of the method of preparation, oils extracted by means of solvents have, in general, a lower acidity than expressed oils. No investigation appears to have yet been made on the oil obtained by maceration of the seeds in hot water, although much of the commercial drug is possibly prepared in this way (cf. U. S. Dispensatory, p. 759, new ed.). In order to determine what influence this process has on the acidity of the oil, a quantity of seeds were crushed and boiled with water; the oil rose to the surface in the form of a coarse emulsion, from which it was extracted by means of ether. Its acid value was 15.6, as compared with 7.7 for the extracted and 8.6 for the expressed oil, from the same seeds.

In conclusion:

(1) The acidity of Chaulmoogra oil varies with time and with the method of preparation; it is, therefore, useless for purposes of identification.

(2) The limits set by the present Pharmacopoeia (British), are much too narrow and indefensible, seeing that no method is specified for the preparation of the oil; they should be altered or preferably left out altogether.

The above work was carried out in the Analytical Laboratories of the Society of Apothecaries (London). My thanks are due to Mr. F. F. Shelley, Ph.C. (Vic.), F.I.C., for initiating this investigation.—Victor Cofman, B.Sc. (London), M. P.S., in *Pharmaceutical Journal*, September 27,1919, p. 269.

DEATH OF JOHN CHARLES UMNEY, AN EX-PRESIDENT BRITISH PHARMACEUTICAL CONFERENCE.

J. C. Umney, president of the British Pharmaceutical Conference in 1913, died at his home (Berea Court, Yapton, Arundel, England), October 9, aged 51 years. His apprenticeship in pharmacy was served with William Martindale; he passed the Minor examination in 1889, the Major in 1890, in which year he also entered the Bloomsbury Square School of Pharmacy and here he received the bronze and silver medals in practical pharmacy. In a number of his researches he was engaged with Professor Dunstan, on the alkaloids of *Aconitum Napellus*, the salicylates, etc. In 1910, he established the *Perfumery and Essential Oil Record*, and he was the author of the monograph on essential oils in Thorpe's "Dictionary of Applied Chemistry." He contributed largely to the last revision of the British Pharmacopoeia. In 1914 he was awarded the Silver Medal of the Royal Society of Arts; other reference to honors and achievements might be made. At the time of his death he was member and director of Wright, Layman & Umney, Ltd.

NEW OFFICERS OF E. FOUGERA & CO., INC.

Upon the death of Mr. Louis V. Heydenreich, president of E. Fougera & Company, it became necessary to elect new officers and at a meeting held recently the following officers were chosen: Montaigu M. Sterling, President and General Manager; Charles M. Russell, Vice-President and Counsel; William H. Ball, Treasurer, Rudolph Wirth, Secretary.

Mr. Sterling has been the Secretary and Treasurer of the company since its incorporation; Mr. Ball has been associated for 37 years and was head of the Financial Department; while Mr. Wirth has spent 44 years of

his life with the concern, having been until recently Sales Manager.

DEATH OF WILLIAM MUENCH.

William Muench, well and favorably known druggist of Syracuse, N. Y., is dead. Deceased settled in Syracuse in 1867, engaging in the drug business. He was associated in other activities and interested in civic and fraternal organizations. In 1873 he married Elizabeth C. Baumer, who, with their eight children, survives. Mr. Muench joined the American Pharmaceutical Association in 1899.

MEMORIAL TO PROFESSOR BOWER T. WHITEHEAD.

The alumni of the School of Pharmacy presented to the South Dakota State College of Agriculture and Mechanic Arts, a bronze memorial tablet in memory of the late Bower Thomas Whitehead, the first Professor of this School of Pharmacy. The tablet was presented at the Commencement exercises on June 2, 1919, by Professor Serles, a former student and assistant of the deceased, and was received by Dr. G. L. Brown, acting President of the College.

W. G. Crockett, who since his discharge from the Chemical Warfare Service has been employed as a chemist with E. I. du Pont de Nemours & Co., Wilmington, Del., was recently elected professor of pharmacy in the College of Pharmacy of Baylor University, Dallas, Tex.

Ex-President and Mrs. Henry H. Rusby announce the marriage of their daughter Ruth to Mr. Maximilian von Hoegen. Members of the A. Ph. A. will learn of the event with much interest not only because of their esteem for the parents of the bride, but because the latter has been a visitor during several of the annual conventions.

Ernest E. Stanford, for some time connected with the Pharmacognosy Laboratory, Bureau of Chemistry, U. S. Department of Agriculture, is now professor of pharmacognosy in the Cleveland School of Pharmacy.

Verne C. Nichols, formerly professor in the pharmacy department of the University of Oklahoma, is now director of the Era Course in Pharmacy.

Arthur P. Schlichting, who has been professor of pharmacy in the North Dakota Agricultural College for several years, has been appointed assistant professor of pharmacy in the University of Michigan and will teach the same subjects formerly conducted by Dean Stevens.

M. Jadin, heretofore professor at Montpelier College of Pharmacy, France, has been nominated Director and Professor of Chemical Pharmacy at the Superior School of Pharmacy, Strasbourg. Professor Jadin was one of the vice-presidents of the International Congress of Pharmacy held in Paris in 1900. Professor Masson, Director of the Montpelier School of Pharmacy, has been nominated a Chevalier of the Legion of Honor.

Revision of the Codex is under consideration at the present time in France. M. Cabannes publishes some interesting suggestions. In his opinion a number of new medications should be included, among these sterilized camphorated oil for hypodermatic use. The question of extracts and the equivalent of extracts in tinctures and menstrua enter into the discussions relative to the revision; also the inclusion of statements relative to physiological action of medicaments. There seems to be a desire for a schedule of medicaments which can be supplied by pharmacists without prescriptions.

SOCIETIES AND COLLEGES.

THE EXPOSITION NUMBER OF THE CHEMICAL BULLETIN, CHICAGO.

The Exposition Number of the *Chemical Bulletin*, published by the Chicago Section, is one of the most elaborate efforts in chemical journalism ever undertaken by members of a local section. There are over one hundred pages of text and advertising matter, including complete programs of the Exposition and the meeting of the various scientific societies held in conjunction with the Exposition. Among the contributors are: W. H. Nichols, Chas. H. Herty, Julius Stieglitz, L. V. Redman, H. E. Howe, John Arthur Wilson, and many others. The vast amount of detailed work connected with the publication of this number must have demanded no small sacrifice from the editors.—*The Catalyst*, Philadelphia.

TO RESTORE BARTRAM'S GARDENS.

Bartram's Gardens, Philadelphia and the home there of the noted naturalist are to be

restored to their original condition under plans announced by the Philadelphia Chapter of the Institute of Architects.

Funds have been turned over to Horace Wells Sellers, chairman of the committee on the Preservation of Historic Monuments, by a "public-spirited Philadelphian" sufficient to defray the expense involved in preparing drawings for the restoration.

Mr. Sellers has announced that the committee will give its services in making the necessary researches and in directing the preparation of the plans, as in the restoration of the State House group of buildings. The restoration of the garden, in West Philadelphia, with as much of its original planting as can be determined from existing records, is now under consideration. As an appreciation of the naturalist's work and an added interest to the visitor in this city, the local Chapter of Architects has issued an appeal that civic organizations coöperate in the restoration.

GEORGE D. ROSENGARTEN, A NOMINEE FOR PRESIDENT AMERICAN CHEMICAL SOCIETY.

The nomination of Dr. Geo. D. Rosengarten has received endorsement. The candidate is favorably known in the American Pharmaceutical Association. He contributed largely to the success of the Peace Meeting of the American Chemical Society.

OFFICERS OF ASSOCIATION OF DAIRY, FOOD AND DRUG OFFICIALS.

The Association of Dairy, Food and Drug officials at the meeting in New York City, during the week of September 8, adopted resolutions urging the appointment of a legislative committee of three to coöperate with the legislative committee of National and State organizations of trades with a view of securing uniform food and drug laws for all the States.

The committee of three was requested to recommend to Congress that provisions contained in paragraph F. section 7, of the National Food and Drug Act be amended. It was contended that under this provision the sale of drug preparations is permitted differing in strength and other qualities from the respective pharmacopoeia and formulary standard, although sold under names recognized by the United States Pharmacopoeia and National Formulary. It is claimed that this has proved unfortunate in its operation in that it has favored the development of variation in the strength of pharmaceutical preparations.

The following officers were elected for the ensuing year: Guy G. Frary, Food Commissioner of South Dakota, president; James Sorenson, of Minnesota, first vice-president; R. E. Rose, of Florida, second vice-president; Fred L. Woodworth, of Michigan, third vice-president; George L. Weigle, of Wisconsin, treasurer, and John B. Newman, of Illinois, Secretary.

The members of the executive committee are: A. M. G. Soule, of Maine; George B. Flanders, of New York, and E. F. Ladd, of North Dakota. On the Committee of Cooperation are: J. S. Abbott, chairman; R. E. Rose and Fred L. Woodworth.

THE ANNUAL MEETING OF THE NATIONAL WHOLESALE DRUGGISTS' ASSOCIATION IN NEW ORLEANS.

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The Pelican has for several months past been conveying news of progress to the members.

OFFICERS OF NATIONAL ASSOCIATION OF RETAIL DRUGGISTS FOR 1919–1920.

President, Theo. F. Hagenow, St. Louis, Mo.

First Vice-President, Wm. O. Oren, Indianapolis, Ind.

Second Vice-President, Elmer E. Chilson, Rochester, N. Y.

Third Vice-President, Chas. J. Clayton, Denver, Col.

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New Members of the Executive Committee (3 Years):

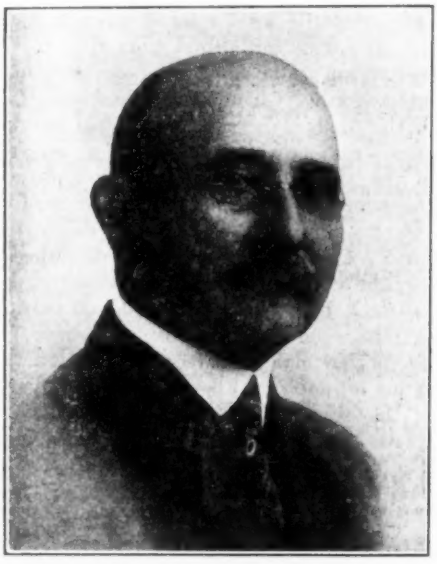
J. H. Riemenschneider, Chicago, Ill.

Charles F. Harding, Cincinnati, O.

Some of the resolutions adopted by the N. A. R. D. at the annual convention, recently held in Rochester, are in part as follows:

PHARMACISTS IN U. S. SERVICE.

Resolved, that the N. A. R. D. heartily endorse the spirit of the Edmonds' bill and strongly urge the passage of a similar bill to advance the standing of pharmacists in the Army and also heartily endorse the introduction and passage of a suitable bill to reorganize the Hospital Corps of the Navy and grant higher rating and advanced commissions to the pharmacists in that corps.



THEODORE F HAGENOW, *President*
N. A. R. D., St. Louis, Mo

Resolved, that every effort and influence at our command be exerted toward the enactment of H. R. 4760, which proposes to provide a permanent commission to members of the Hospital Corps in the United States Navy and that it is but just and right that the honorable and praiseworthy services rendered by many pharmacists in this branch of the service be suitably recognized.

NO LIQUOR PERMITS.

Resolved, That in view of the pending and proposed legislation to prohibit the sale of alcoholic liquors, the N. A. R. D., in convention assembled, is of the opinion that such legislation should not provide for the sale by the pharmacists of the country of such alcoholic liquors for any purpose and urges every retail druggist to refrain from taking out a liquor permit.

HARRISON ANTI-NARCOTIC LAW.

Resolved, That the N. A. R. D. express its intense disapproval of the classification of dealers under the Harrison anti-narcotic law which makes it necessary for the retail druggists to register in two or more classes.

NO COMPULSORY HEALTH INSURANCE.

Resolved, That the N. A. R. D. continue its efforts to prevent the enactment of compulsory health insurance legislation, either by the legislatures of the several states or by the Congress of the United States.

COÖPERATION.

Resolved, That it is the sentiment of this convention that methods should be adopted to insure the closer coöperation of the two parent national organizations of retail pharmacists and that a committee be appointed by the N. A. R. D. with instructions to cooperate with a similar committee of the A. Ph. A. in order to devise the best ways and means toward the accomplishment of this end.

THE PHARMACIST AND THE LAW.

ARMY REORGANIZATION—PROPOSED SECTION RELATING TO MEDICAL SERVICE CORPS.

A Medical Service Corps is hereby established, which shall be a part of the Medical Department, and shall consist of a commissioned force and an enlisted force.

The commissioned force of the Medical Service Corps shall consist of officers, the total number of whom shall approximately be equal to one for every 2,000 of the total enlisted strength of the Regular Army authorized from time to time by law, and shall be distributed by grades as follows: Majors, 25 percent; captains and first lieutenants, 75 percent: *Provided,* That if by reason of a reduction by law of the authorized enlisted strength of the Regular Army the total number of officers in the Medical Service Corps commissioned previously to such reduction shall for the time being exceed the equivalent of one for 2,000 of such reduced enlisted strength, the total number of said officers shall be reduced to said equivalent in the manner prescribed by the first proviso of section 10 of the National Defense Act approved June 3, 1916

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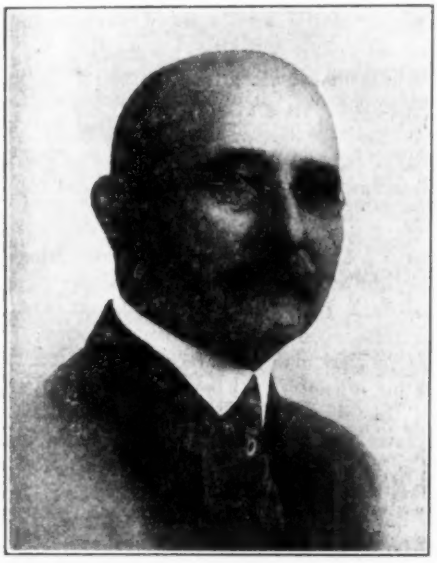

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Resolved, That in view of the pending and proposed legislation to prohibit the sale of alcoholic liquors, the N. A. R. D., in convention assembled, is of the opinion that such legislation should not provide for the sale by the pharmacists of the country of such alcoholic liquors for any purpose and urges every retail druggist to refrain from taking out a liquor permit.

HARRISON ANTI-NARCOTIC LAW.

Resolved, That the N. A. R. D. express its intense disapproval of the classification of dealers under the Harrison anti-narcotic law which makes it necessary for the retail druggists to register in two or more classes.

NO COMPULSORY HEALTH INSURANCE.

Resolved, That the N. A. R. D. continue its efforts to prevent the enactment of compulsory health insurance legislation, either by the legislatures of the several states or by the Congress of the United States.

COÖPERATION.

Resolved, That it is the sentiment of this convention that methods should be adopted to insure the closer coöperation of the two parent national organizations of retail pharmacists and that a committee be appointed by the N. A. R. D. with instructions to cooperate with a similar committee of the A. Ph. A. in order to devise the best ways and means toward the accomplishment of this end.

THE PHARMACIST AND THE LAW.

ARMY REORGANIZATION—PROPOSED SECTION RELATING TO MEDICAL SERVICE CORPS.

A Medical Service Corps is hereby established, which shall be a part of the Medical Department, and shall consist of a commissioned force and an enlisted force.

The commissioned force of the Medical Service Corps shall consist of officers, the total number of whom shall approximately be equal to one for every 2,000 of the total enlisted strength of the Regular Army authorized from time to time by law, and shall be distributed by grades as follows: Majors, 25 percent; captains and first lieutenants, 75 percent: *Provided,* That if by reason of a reduction by law of the authorized enlisted strength of the Regular Army the total number of officers in the Medical Service Corps commissioned previously to such reduction shall for the time being exceed the equivalent of one for 2,000 of such reduced enlisted strength, the total number of said officers shall be reduced to said equivalent in the manner prescribed by the first proviso of section 10 of the National Defense Act approved June 3, 1916

(39 Statutes at Large 166), respecting the Medical Corps: *Provided further*, That the number of majors in the Medical Corps authorized by section 10, of the National Defense Act, approved June 3, 1916 (39 Statutes at Large 166), shall be diminished by the number of majors in the Medical Service Corps, and the number of captains and first lieutenants in the Medical Corps shall be diminished by the number of captains and first lieutenants in the Medical Service Corps: *Provided, however*, That nothing in the last preceding proviso shall be held or construed so as to discharge any officer from the Medical Corps of the Regular Army or to deprive him of the commission which he now holds therein.

The officers of the Medical Service Corps shall be utilized so far as practicable in the performance of the business and administrative functions of the Medical Department, to wit, as adjutants of Medical Department units, registrars of hospitals, pharmacists, medical property and supply officers, medical finance officers, hospital mess officers, and in other positions where the special professional training of medical officers is not required.

Officers of the Medical Service Corps shall be appointed by the President, by and with the advice and consent of the Senate, from among the noncommissioned officers of the Medical Service Corps and of the Veterinary Corps who shall have served not less than 5 years in one or both of said corps, including service in the Hospital Corps and in the enlisted force of the Medical Department, and not less than 3 years in noncommissioned grades, who shall at the date of appointment be citizens of the United States and not more than 32 years old, and who shall have been found qualified by a board of not less than three officers of the Medical Department for the duties of commissioned officers of the Medical Service Corps upon such examination as shall be prescribed by the Secretary of War: *Provided*, That persons who, having previously been enlisted men in the Medical Department of the Army for not less than 5 years, shall have served honorably as commissioned officers in the Army of the United States during the war with Germany, shall until July 1, 1920, be eligible regardless of age for appointment to original vacancies in any grade in the Medical Service Corps created by this section.

The enlisted force of the Medical Department is hereby merged into the Medical Service Corps, and from and after the passage of this act shall constitute and be known as the enlisted force thereof. The total strength of the enlisted force of the Medical Service Corps shall be approximately equal to, but not exceed, except as provided in section 10 of the national defense act approved June 3, 1916 (39 Stat. L., 166), the equivalent of $5\frac{1}{4}$ percent of the total enlisted strength of the Regular Army authorized from time to time by law, and shall include the grades of chauffeur and wagoner. Chauffeurs and stable sergeants of the Medical Service Corps shall have the same rank, pay, and allowance as sergeants of the Medical Service Corps, and wagoners the same pay and allowances as wagoners of Infantry. Privates first class of the Medical Service Corps shall be eligible for ratings as surgical assistant, laboratory assistant, X-ray assistant, dispensary assistant, dental assistant, or nurse, each at $5 a month: *Provided*, That no enlisted man shall receive more than one rating for additional pay under the provisions of this section, nor shall any enlisted man receive any additional pay under such rating unless he shall have actually performed the duties for which he shall be rated.

Except as hereinbefore provided, original appointments in the commissioned force of the Medical Service Corps shall be in the grade of first lieutenant, and first lieutenants shall, subject to the prescribed examination, be promoted to the grade of captain after five years' service in the commissioned force of the Medical Service Corps: *Provided, however*, That the period during which any first lieutenant of the Medical Service Corps shall have served between April 6, 1917, and July 1, 1920, as a commissioned officer in the Army of the United States, shall be counted as a portion of the period of service required to make him eligible for promotion to the grade of captain.

Except as hereinbefore provided, the laws governing promotion in the Medical Corps shall so far as applicable govern promotion in the commissioned force of the Medical Service Corps.

Officers of the Medical Service Corps shall exercise command only in their own corps: *Provided*, That nothing in this act or any other law shall be held to deny or abridge the right of officers of the Medical Corps to exercise command in and over the Medical Service Corps.

Surgeon General Ireland favors the incorporation of this section.

WHOLESALE AND RETAIL LIQUOR DEALERS' SPECIAL STAMP TAXES.

Under existing internal revenue laws, persons who qualify as wholesale dealers in distilled spirits, whether for beverage or non-beverage purposes, are required to pay a Federal stamp tax of $100 per year, as wholesale liquor dealers. This tax covers those dealers who sell alcohol in quantities of five gallons or more. A stamp tax of $25 per year as retail liquor dealer is required of those who sell alcohol in quantities of less than five gallons. If a wholesale drug house sells less than five gallons at a time and also five gallons or more it is necessary to pay both special taxes and keep such records as are required for dealers selling in quantities of five gallons or more.

Owing to the confusion that followed the enactment of the Food Control Act of August 10, 1917, differentiating between beverage and non-beverage alcohol, and the inauguration of the bond and permit system, collectors of internal revenue in some localities have failed to enforce the tax requirements universally.

The following is reprinted from a letter of Attorney W. L. Crounse to Secretary F. E. Holliday of the N. W. D. A.:

"In view of the general misunderstanding which appears to prevail, not only among wholesale druggists but among collectors of internal revenue and their subordinates in certain districts, concerning liability of wholesale druggists to pay a special tax as wholesale liquor dealers if they handle spirits, even though their operations may be confined to the purchase and sale of non-beverage alcohol, the following facts are presented:

"When Congress first differentiated non-beverage alcohol from beverage alcohol and provided different rates of tax thereon, the Internal Revenue Bureau officials informally decided that dealers handling non-beverage alcohol, but not handling beverage spirits of any kind, could not be exempted from the provisions of the law requiring them to pay a special tax either as wholesaler or retailers, according to the quantities dealt in. This ruling was not formally promulgated: hence many dealers did not have it brought to their attention at the time.

"When it became necessary to revise Treasury Decision 2788, the bureau officials decided to incorporate therein a specific provision holding parties selling non-beverage alcohol to be liable to special tax as liquor dealers. This provision in T. D. 2788 as revised and approved February 26, 1919, follows:

"17. Special tax as retail or wholesale liquor dealer must be paid by all persons who sell beverage or non-beverage distilled spirits or wines as such, including homeopathic potencies, attenuations and dilutions; with the exception that under the provisions of section 3246, revised statutes, special tax will not be incurred by wine-makers who sell wine produced by them at the place where produced or at one general business office."

"Notwithstanding the incorporation of this provision in T. D. 2788 a number of wholesale druggists and a few collectors of internal revenue have evidently remained in ignorance of its existence. Certain collectors have quite recently advised wholesale druggists that if their dealings in spirits were limited to non-beverage alcohol they were not liable for a special tax.

"The Internal Revenue Bureau adheres strictly to the provision in section 17, T. D. 2788, above quoted, and calls attention to the fact that the statute is retroactive as to any period for which the tax has not been paid, and further points out that failure to pay the tax within thirty days after same became due involves a penalty of 50 percent of the tax. It is understood, however, that where dealings have been limited strictly to non-beverage spirits and where the circumstances of the case, as indicated by the collectors' report thereon, show that the delinquent dealers have acted in good faith and were in fact ignorant of the requirement of the law and regulations, the penalty will be waived.

"It should be understood that the liability of a dealer to pay a special tax depends upon the quantities in which spirits are sold. Dealers selling less than five gallons in a single transaction are liable as retailers, and those selling five gallons or more, as wholesalers, while those whose sales include both more and less than five gallons must qualify as both wholesalers and retailers."

MEDICINAL STANDARDS FOR ALCOHOLIC OR WINE PREPARATIONS.

The Bureau of Internal Revenue has expressed its requirements for medicinal preparations in which non-beverage alcohol or non-beverage wine are used, as follows:

Any preparation in which an alcoholic menstruum is used, whether distilled spirits or wine, if the same contains in each fluidounce

a dose as a whole, or in compatible combination of one or more agents of recognized therapeutic value, and that contains no agents either chemically or physiologically incompatible with the active medicinal agents upon which the medicinal claims are based and only sufficient alcohol for extraction, solution and preservation, will be held to be a bona fide medicine if made and sold in good faith, as such. Any such preparation will be properly entitled to the use of non-beverage alcohol or non-beverage wine.

MANUFACTURERS LIABLE WHEN PREPARATIONS ARE SUB-STANDARD.

Where flavoring extracts and toilet articles have been manufactured and marketed otherwise than strictly according to regulations (see T. D. 2788), the manufacturer will be subjected to the taxes and penalties provided, despite any lack of evidence of bad faith or neglect on his part. This is the practice of the Commissioner of Internal Revenue as outlined in recent instructions to collectors. It is necessary, therefore, that every manufacturer sees to it that his preparations are at all times made in accordance with prescribed standards and regulations and marketed under conditions that will assure him of their legitimate consumption.

HARRISON NARCOTIC LAW.

The amendments to the Harrison Anti-Narcotic Law went into effect on February 25, 1919, and under the provisions of those amendments manufacturers, wholesalers, retailers, physicians and general stores were all placed in separate classes, each to pay a different license fee.

The fees for special taxes are as follows:

Manufacturers, importers, etc.	$24.00 per year
Wholesalers	12.00 per year
Retailers	6.00 per year
Physicians, hospitals, colleges, etc.	3.00 per year
General store (selling exempted articles)	1.00 per year

The wholesaler is defined as a dealer in original stamped packages.

The retailer is one who dispenses from an original stamped package on the prescription of a duly registered physician.

The manufacturing class covers any one who imports, compounds, produces or manufactures any opium, coca leaves or any of their salts, derivatives or compounds, provided such preparations or compounds contain a larger quantity of narcotic than is specifically exempted by section 6 of the law as amended.

The definition of manufacturer caused some difficulty among retailers who occasionally compound preparations or repack preparations to be sold on an official order form. Such acts render the retailer liable for the manufacturer's special tax.

Similarly the sale of a single stamped package of narcotics to a hospital or physician renders the retailer liable for the wholesaler's special tax of $12 per year.

Special records for each class of registrant must be kept and returns rendered monthly to the collector of internal revenue, forms for such returns to be embodied in the regulations of the Commissioner of Internal Revenue.

Retailers may, however, without incurring liability as a manufacturer or as wholesale dealer, furnish upon a properly made out order form of a registered person an aqueous, narcotic solution, not to exceed one ounce.

The ruling on this subject is as follows:

The office has decided that a person registered as a retail dealer can furnish upon the properly prepared order form of a registered person, an aqueous narcotic solution in an amount not to exceed one ounce, without incurring liability as a wholesale dealer.

No change has been made in regard to the sale on order forms of other narcotic drugs in small quantities. In such case liability is incurred by the druggist as wholesale dealer, if he sells in the original package, or as a manufacturer if he repacks and sells on an order form a quantity less than an original stamped package.

H. M. GAYLORD,
Deputy Commissioner.

FIRST-AID IN FRANCE.

Recently a French pharmacist was requisitioned by the municipal authorities of Grenoble to attend a wounded man. The pharmacist refused to do so, and the case was taken into court, where judgment was rendered against him. Seemingly the case was to try out the legality of giving first aid in pharmacies.

BOOK NOTICES AND REVIEWS.

Pharmacopoea Nederlandica. Editio Quarta. Supplenda et mutanda. Typis J. H. de Bussy —Amstelodami, MCMX. The fourth edition of the Pharmacopoea Nederlandica was published in 1905 and became official on July 1, 1906. In 1910 this supplement was published. It was compiled by a committee of ten, consisting of six university professors, three pharmacists and one medical officer of the army. The supplement is divided into two parts, part I containing additional articles to the Pharmacopoeia and part II changes in the texts of the official descriptions. The rapid progress in the manufacture of synthetic drugs as well as the omission of some much-used drugs necessitated the adoption of nine chemicals such as aspirin, veronal, pyramidon, adrenalin, etc., of one emulsion (cod liver oil), one fluidextract (kola), two drugs (lavender flowers and kola nut), one solution (adrenalin solution 1 : 2000), one reagent (Million's) and one volumetric solution ($n/10$ potassium iodide solution).

Part II of the Supplement contains about eighty changes in the descriptions of the official drugs and preparations, their requirements and standards.

The Supplement, like the Pharmacopoeia, is written in Latin.

A second supplement, written in Dutch, and published by Gebr. Belinfante in 's Gravenhage in 1914, was compiled by a committee of thirteen, six of whom were university professors while the remaining seven were either pharmacists or were engaged in their capacity as pharmacists in Government work. This Supplement gives eight additional chemicals (such as organic silver preparations, collargol and protargol, calcium and sodium glycerophosphates, novocain, tropacocaine, etc.), one organo-therapeutic drug (thyroid gland), one drug (adonis), one oil (chaulmoogra oil) and one paste (zinc paste). A list of reagents comprising methyl red, ammonium molybdate is also added.

In part II twenty-three changes in the description and standards of official drugs and preparations are given.

The scarcity of fats in Holland during the war necessitated the issuing of a third supplement which was published in 1918 by the publishers of the second supplement. It is written in Latin and directs that crude oleic acid be used for making lead plaster, soft soap and tincture of soap. A description of the acid and the requirements for it are given. Formulae are given for making glycerin ointment and glycerin ointment with sulphur, replacing fats, vaseline or paraffin, by starch paste.

These three official supplements give valuable information on the subjects they contain and make the Pharmacopoea Nederlandica an up-to-date book which compares favorably with all the modern pharmacopoeias.

Supplement op de vierde Uitgave der Nederlandsche pharmacopee. Uitegeven door het Department Rotterdam de Nederlandsche Naatschappij ter bevordering der pharmacie, De Gebroeders van Cleef, Publishers. 's Gravenhage. 1914.

In addition to the above three official supplements to the Pharmacopoea Nederlandica, a very comprehensive supplement has been published by the Dutch Society for the Advancement of Pharmacy. It is written in Dutch, is compiled by a committee of six and contains more than 400 additional subjects to the official Pharmacopoeia. In part I of the Supplement about 100 chemicals, 34 of which are official in the U. S. P. and 3 in the N. F., were added; further, 28 alkaloids, alkaloidal salts and glucosides, 9 of which appear in the U. S. P. and 2 in the N. F. It was found necessary to describe 36 new remedies, mostly synthetics, now in general use. Fifty-seven vegetable drugs were added; 12 of these are described in the U. S. P. and 10 in the N. F. The greatest number of additions is in the line of pharmaceutical preparations. There were added 5 vinegars, 21 waters, 33 fluidextracts and solid extracts, 15 pills, 18 powders, 10 medicated soaps, 24 syrups, 16 solutions, 6 species, 11 spirits, including 3 beverages (rum and two kinds of brandy), 41 tinctures, 20 ointments and 4 wines. Of these additions more than 100 are official in the U. S. P. and about 40 in the N. F. Corrosive sublimate tablets are made from equal parts of mercuric chloride and sodium chloride and are colored red with eosin.

In part II of the book 24 reagents for qualitative analysis and five volumetric solutions were added to those described in the Pharmacopoeia. Further, 28 reagents generally used for microscopic examinations, 18 of which are properly directed to be kept protected from light. Then follow lists of such poisonous substances as should be kept under lock and of such drugs as should be plainly

marked as poisons. A list of chemicals and solutions for filling galvanic batteries and finally a list of antidotes in cases of poisoning are given.

This supplement, together with the Pharmacopoeia, corresponds to our two dispensatories, although it covers fewer subjects than these. It is a very comprehensive compilation of modern pharmaceutical knowledge and is of great value to all engaged in pharmaceutical work.

Codex Medicamentarius Homœopaticus Nederlandicus. Edidit Vereeniging van Homœopathische Geneesheeren in Nederland. J. H. de Bussy. Amstelodami. 1913. Up to 1913 Holland was without a homœopathic pharmacopoeia and was almost entirely dependent on the German, the British and American homœopathic pharmacopoeas. It was originally intended to publish a supplement to the Pharmacopoeia Nederlandica which should contain all those drugs and preparations used in homœopathic practice. A committee for preparing this supplement was nominated by the Government in 1904. In 1910 when the committee had completed its work it was decided not to attach this homœopathic part to the Pharmacopoeia but to publish it under a separate title, the *Nederlandisch Homœopathisch Artsenijboek*. The committee consisted of five members, and had the coöperation of the majority of the homœopaths in Holland.

The Codex is a very comprehensive work and includes all the drugs and preparations used in homœopathic practice. It contains about 70 chemicals, about 90 vegetable drugs and 3 drugs of animal origin, 55 essences, 35 homœopathic tinctures, but only three alkaloidal salts. Explicit directions are given for making the pharmaceutical preparations, such as essences, globules, triturations, etc. In part II of the book are six tables, giving the percentages of alcohol in hydro-alcoholic mixtures by volume and weight, the percentage of juice and solid matter in fresh vegetable drugs, reagents used in qualitative analysis and atomic weights.

The Codex compares very favorably with other publications of this kind and should be in the library of every pharmacist engaged in dispensing homœopathic preparations. Although practically all the drugs and preparations in the Codex are given in the American homœopathic pharmacopoeia also, the description of the subjects in the former differs somewhat from that in the latter. The text is written in Latin.

Formularium Medicamentorum Nederlandicum. F. M. N. This pocket edition of pharmaceutical formulae compiled by a committee of five, two of whom were nominated by the Dutch Society for the Advancement of Medicine and three by the Dutch Society for the Advancement of Pharmacy, is a very useful book. The book was compiled in order that an authoritative and uniform recipe book might be had to replace those used in different parts of Holland. The booklet contains about 120 recipes for internal use, comprising 21 decoctions, 6 emulsions, 10 infusions, 20 mixtures, 25 pills, 30 powders, etc. In part II about 60 preparations for external use are given, among these 4 injections, 4 liniments, 6 lotions and 20 ointments. A tablespoonful is given as containing 15 mils, a dessertspoonful 8 mils and a teaspoonful 3 mils. In nearly all of the preparations the amount of drug in one teaspoonful, tablespoonful, wine-glassful, etc., respectively, is given. The booklet is written in Dutch and published in 1908 by Schletema and Holkema's Bookstore in Amsterdam.

H. E.

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